



FINAL ENVIRONMENTAL BASELINE SURVEY

Southern Portion of the National Interagency Biodefense Campus on Area A at Fort Detrick, Maryland

Prepared for:

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Washington, DC 20528**

and

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EXECUTIVE SUMMARY

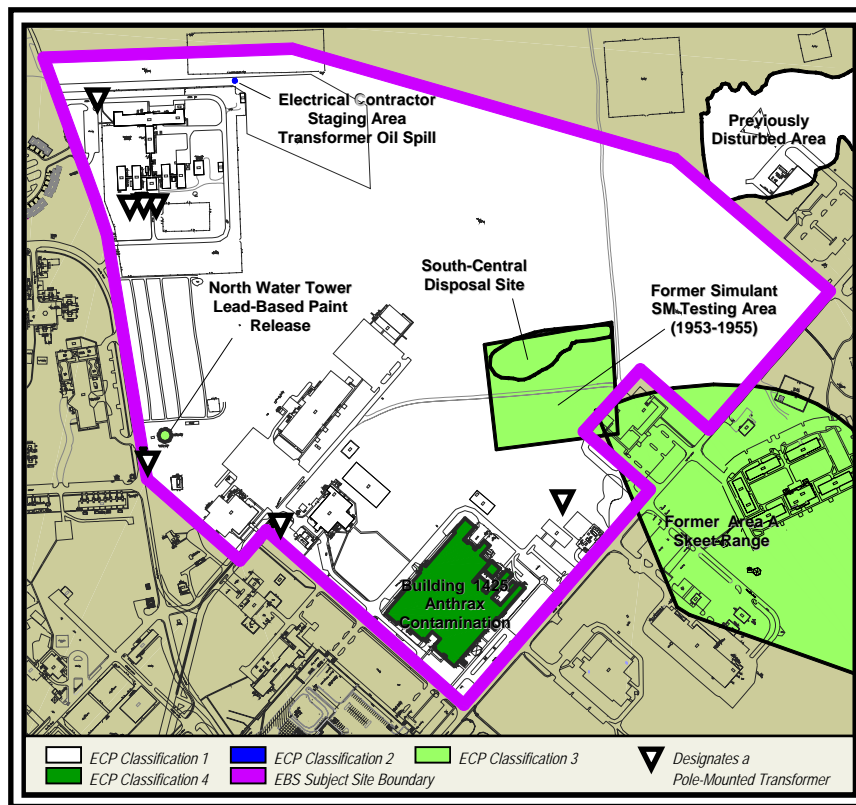
An Environmental Baseline Survey (EBS) was conducted to characterize the existing environmental conditions on and around the southern portion of the National Interagency Biodefense Campus (NIBC) at Fort Detrick in Frederick County, Maryland. The NIBC will be comprised of laboratory facilities for biodefense research. The EBS subject site encompasses approximately 124.1 acres in the south-central portion of Area A of the Installation. The parcel is partially developed with administrative and laboratory facilities. The remaining undeveloped portions of the site are primarily grasslands.

Planning for the agencies which will occupy the NIBC is a dynamic process. At this time the precise locations of the various agencies within the NIBC are uncertain, however, the final locations of the facilities will be within the boundaries of the EBS subject site. It is unlikely that buildings currently on the site will be part of any real estate action associated with the NIBC.

Land constituting the EBS subject site was categorized into one of seven Environmental Condition of Property (ECP) classifications described in DA PAM 200-1 (*Environmental Protection and Enhancement*) dated 17 January 2002:

- *“Classification 1. (white) Definition: Areas where no release or disposal of hazardous substances or petroleum products has occurred, including no migration of these substances from adjacent areas.*
- *Classification 2. (blue) Definition: Areas where only release or disposal of petroleum products has occurred.*
- *Classification 3. (light green) Definition: Areas where release, disposal, and/or migration of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.*
- *Classification 4. (dark green) Definition: Areas where release, disposal, and/or migration of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.*
- *Classification 5. (yellow) Definition: Areas where release, disposal, and/or migration of hazardous substances has occurred, and removal or remedial actions are under way, but all required remedial actions have not yet been taken.*
- *Classification 6. (red) Definition: Areas where release, disposal, and/or migration of hazardous substances has occurred, but required actions have not yet been implemented.*
- *Classification 7. (gray) Definition: Areas that are not evaluated or do not require additional evaluation.”*

The most significant results of the EBS are summarized in the figure below. Colors used on the figure correspond to the ECP classifications in DA PAM 200-1.



Details of the evaluations of the individual sites indicated on the above figure are discussed below.

- The site of a former recreational skeet range adjoins the NIBC on the southeast (a small portion of the campus near Building 1434 may have been affected). Residues of lead in the soil at this area were slightly elevated with respect to background levels but well below Maryland Department of the Environment risk-based concentration limits for residential or industrial land use, and remediation was not deemed necessary. This area is designated as ECP Classification 3 (areas where release, disposal, and/or migration of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action).
- The soil associated with the north water tower, located within the western portion of the EBS subject site, has lead concentrations above maximum background levels and U.S. Environmental Protection Agency residential and industrial screening levels based on a Remedial Investigation. The elevated level of lead was attributed to the weathering and sandblasting of lead-based paint covering the north water tower. A human health risk assessment for the north water tower site concluded that non-residential use of the site will not pose an elevated risk of adverse effects on human health and recommended no further remedial action for this site. This area is designated as ECP Classification 3 (areas where release, disposal, and/or migration of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action).
- On 10 February 2004, U.S. Army Garrison (USAG) personnel observed a pole-mounted-type transformer lying on its side within the Electrical Contractor Staging Area for the

Allegheny Power (Old Farm) electrical substation. The Electrical Contractor Staging Area is located north of Building 1301 on the EBS subject site. Visual observations determined that approximately five gallons of potentially polychlorinated biphenyl (PCB)-contaminated oil had leaked in the immediate vicinity of the transformer. The transformer was placed in an overpack drum for off-site disposal by Allegheny Power. Initial field screening of the transformer oil indicated less than 50 parts per million (ppm) of PCBs. Follow-up laboratory analysis of the transformer oil verified PCB concentrations of less than 50 ppm. Approximately 30 gallons of soil in the immediate area of the spill was removed and placed in a 55-gallon drum and transported to the Fort Detrick Hazardous Material Management Office for storage and future disposal. Upon receipt of laboratory analytical results indicating non-hazardous characteristics, the soil was transferred to the Fort Detrick incinerator for disposal. This area is designated as ECP Classification 2 (areas where only release or disposal of petroleum products has occurred).

- A release of anthrax bacteria (*Bacillus anthracis*) occurred at a laboratory within Building 1425 (the main research facility of the U.S. Army Medical Research Institute of Infectious Diseases [USAMRIID]), located in the southern portion of the EBS subject site. Evaluation by USAMRIID concluded that the contamination was localized and due to a breach of lab procedures. Approximately 100 employees, who work in the vicinity of the affected area, were temporarily relocated and all potentially contaminated areas were disinfected with bleach. The facility was declared to be safe as of 22 April 2002. This area is designated as ECP Classification 4 (areas where release, disposal, and/or migration of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken).
- A previously disturbed area (apparently scraped or graded by heavy equipment), adjoining the northeast corner of the EBS subject site, was indicated from examination of aerial photographs from circa 1976. However, ground-proofing by personnel from BSA Environmental Services, Inc. and the USAG in December 2003 found no evidence of contamination. The area is currently grassland with a fenced-in antenna. This area is designated as ECP Classification 1 (areas where no release or disposal of hazardous substances or petroleum products has occurred, including no migration of these substances from adjacent areas).
- A previously unknown 2-acre disposal site, approximately 400 feet northwest of Building 1434, was revealed by an airborne geophysical survey during 2001. The presence of buried materials was suspected, and subsequent investigations by visual reconnaissance, a ground-level electromagnetic sweep, and a trenching study indicated that the site had been used for the disposal of construction and/or demolition debris. Soil samples from the site had contaminant concentrations within background levels of the area. This area is designated as ECP Classification 1 (areas where no release or disposal of hazardous substances or petroleum products has occurred, including no migration of these substances from adjacent areas).
- An approximately 6-acre area including portions of the proposed sites for the National Biodefense Analysis and Countermeasures Center and the National Institute of Allergy and Infectious Diseases was used for outdoor testing of a biological simulant during 1953-1955. The previously unknown 2-acre disposal site discussed above is contained within the former outdoor testing site. The simulant used was *Serratia marcescens*, a human pathogen responsible for a large percentage of nosocomial (hospital-related) infections. Human infections attributable to *S. marcescens* outside of hospital settings

are uncommon. Although no testing has been performed to detect the presence of the bacterium, ample evidence from the literature indicates it is highly unlikely that populations of the organism would survive after 50 years. This area is designated as ECP Classification 3 (areas where release, disposal, and/or migration of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action).

- The possible presence of PCBs in the seven pole-mounted transformers observed on the southern portion of the NIBC is a potential concern. Though no evidence of a release of PCBs was noted during the site reconnaissance and there were no records of such a release occurring, there is potential that the pole-mounted transformers may leak in the future, releasing PCBs into the environment. No record was found indicating if these transformers contain PCBs. The locations of these transformers are designated as ECP Classification 1 (areas where no release or disposal of hazardous substances or petroleum products has occurred, including no migration of these substances from adjacent areas).

Based on the ECP classification of the land within the EBS subject site discussed above, environmental conditions on the EBS subject site should not significantly impact real property actions.

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1.0 INTRODUCTION

This report presents the results of an Environmental Baseline Survey (EBS) for the southern portion of the National Interagency Biodefense Campus (NIBC) in Area A at Fort Detrick, Maryland. BSA Environmental Services, Inc. personnel assisted in the preparation of this EBS, which includes limited research, review of specified listings, and site reconnaissance.

1.1 SCOPE

The purpose of this EBS is to determine the presence, or potential presence, of any hazardous substances or petroleum products on the subject property under conditions that indicate an existing release or a past release. The EBS also assesses the likelihood of a future release into structures or into the ground, groundwater, or surface water on the subject property based on current conditions on the subject site and on neighboring properties. An EBS provides sufficient information to adequately identify the potential environmental contamination liabilities associated with real property acquisition, lease, transfer, or disposal. This EBS has been prepared to reflect the general scope and methodology as defined by the American Society for Testing and Materials (ASTM) Standard Practice D 6008-96 *Standard Practice for Conducting Environmental Baseline Surveys*, 1996.

Items considered in determining the type and quantity of hazardous substances stored, released into structures or the environment, or disposed of on the site and adjoining areas were based on available information. Specific review activities performed during the EBS included:

- On-site reconnaissance to identify indicators of concern.
- Review of U.S. Geological Survey (USGS) maps to obtain information on the topography of the site and uses of the surrounding area.
- Review of aerial photographs of the area.
- A search of Federal and state environmental records.
- Informal interviews with U.S. Army Garrison (USAG) personnel.
- Review of files/records of the Fort Detrick Installation.
- Off-site reconnaissance on public thoroughfares and adjacent properties for uses and environmental consequences thereof.

After completing the records review and visual site inspection, the land encompassing the southern portion of the NIBC has been categorized into one of seven environmental condition of property (ECP) classifications described in DA PAM 200-1 (*Environmental Protection and Enhancement*) dated 17 January 2002:

- *Classification 1.* Definition: Areas where no release or disposal of hazardous substances or petroleum products has occurred, including no migration of these substances from adjacent areas.
- *Classification 2.* Definition: Areas where only release or disposal of petroleum products has occurred.

- *Classification 3.* Definition: Areas where release, disposal, and/or migration of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.
- *Classification 4.* Definition: Areas where release, disposal, and/or migration of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.
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- *Classification 6.* Definition: Areas where release, disposal, and/or migration of hazardous substances has occurred, but required actions have not yet been implemented.
- *Classification 7.* Definition: Areas that are not evaluated or do not require additional evaluation.

1.2 LIMITATIONS AND EXCEPTIONS

An EBS is conducted to formulate an opinion on the potential for hazardous substances to exist at a site at levels likely to warrant remediation pursuant to regulations of the U.S. Environmental Protection Agency (USEPA). Opinions relative to the potential presence of hazardous substances given in this report are based on information derived from the most recent site reconnaissance and from other activities described herein. Site reconnaissance was performed on 17 December 2003 and 07 January 2004.

The Department of Homeland Security (DHS) and USAG are herewith advised that the conditions observed are subject to change. Certain indicators of the presence of hazardous substances may have been latent during the most recent site reconnaissance and may subsequently become observable. In addition, the research effort conducted for an EBS is necessarily limited. Accordingly, the research for this EBS, although fully appropriate, may not have disclosed the existence of additional information sources. Assuming such sources exist, their information could not have been considered in the formulation of these findings.

The findings and opinions in this EBS are based upon information obtained from the sources identified, which the preparers believe to be reliable. Nonetheless, complete accuracy and reliability of the information cannot be guaranteed. This report is not a comprehensive site characterization and should not be construed as such. The EBS by its nature is limited. However, the preparers believe that the appropriate level of care and due diligence have been applied to justify the findings, conclusions, and recommendations of this report as it relates to the proposed project and real property actions.

2.0 SITE DESCRIPTION

2.1 LOCATION DESCRIPTION

The location of the southern portion of the NIBC is in the south-central portion of Area A at Fort Detrick in Frederick County, Maryland. The NIBC will include laboratory facilities that operate at Biosafety Level-3 and -4. The Installation consists of four separate parcels of land, Areas A, B, and C (two parcels), which cover a total of approximately 1,143 acres. Comprising more than 700 acres, Area A is the largest and most intensively developed section of Fort Detrick (see Figure 2-1). It is the location of administrative buildings, community service facilities, recreation areas, advanced research and development complexes, and military and family housing for the Installation (USAG, 2003).

2.2 SITE AND VICINITY CHARACTERISTICS

The southern portion of the NIBC (hereafter “the EBS subject site”), as depicted in Figure 2-2, comprises approximately 124.1 acres (5,404,488 square feet [ft.²]) in the south-central portion of Area A. The parcel of land is bound by an irregularly shaped border. The EBS subject site is bordered to the north by undeveloped land (Forest Block 1), to the west by Ditto Avenue, and to the south by Porter Street. The boundary of the northeastern portion of the EBS subject site extends northeast of an electrical power transmission line right-of-way, approximately 70 feet (ft.) southwest of Building 1435 (see Figure 2-3).

The majority of the EBS subject site consists of undeveloped land (see Figure 2-4). A portion of Forest Block 1 lies within the northern end of the EBS subject site. Twenty-six buildings currently exist on the EBS subject site (see Figure 2-3). The age, occupancy, usage, and size of buildings that currently exist on the EBS subject site are shown in Table 2-1 (Federline, 2003; Federline, 2004a). The U.S. Department of Agriculture (USDA) occupies Buildings 1301-1316 in the northwest corner of the EBS subject site. An Allegheny Power (AP) electrical substation was constructed in 2003 on an easement east of the USDA complex. The U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID) occupies the following buildings, which are located on the southern portion of the EBS subject site: Buildings 1408 (currently under construction), 1412, 1414, 1425, and 1438. USAG Directorate of Information Management (DOIM) occupies Building 1422 for Installation information services. Building 1423 currently serves as administrative offices for U.S. Army Medical Materiel Agency (USAMMA), Air Force Medical Logistics Office (AFMLO), and Joint Readiness Clinical Advisory Board (JRCAB). A small stormwater management pond is located southeast of the proposed site of the National Biodefense Analysis and Countermeasures Center (NBACC). Additionally, a water tower and USDA agricultural fields are located on the western portion of the EBS subject site. Figure 2-5 shows the layout of the EBS subject site. Approximately 15.4 acres of impervious surfaces are currently present on the 124.1-acre EBS subject site.

Land use/cover features surrounding the EBS subject site include the following: undeveloped land (Forest Block 1) to the north, Building 1435 (21st U.S. Army Signal Brigade) to the northeast, Building 1434 (Barquist Army Health Clinic) to the east, and housing and community support facilities to the southeast, south, southwest, and west of the EBS subject site (see Figure 2-2 and Figure 2-3). Buildings 1400, 1401, and 1404 (located immediately southwest of Building 1422) are currently utilized for USAG family housing and a garage. Appendix A provides photographs of the EBS subject site.

2.3 PAST AND CURRENT USES OF THE SITE

Fort Detrick (named “Detrick Field” in 1931) was utilized as an airfield by the Maryland National Guard and U.S. Army from 1931 to 1942 (Covert, 2000). The EBS subject site is part of a 502-acre tract that was purchased by the U.S. Army in 1952. The land was bought to expand the research and development facilities in Area A of the then named Camp Detrick Biological Warfare Research Center. Prior to 1952, the land was used for farming. Camp Detrick was designated a permanent installation for biological research and development shortly after World War II, but its status was not affirmed until 1956, when it became Fort Detrick (Covert, 2000).

A possible recreational skeet range in the southeast corner of Area A was identified in November 2002. The range was in operation from approximately the 1950s through the 1980s. The former skeet range was located at Building 1520 and extended out approximately 1,000 ft., in an arc southeast to north-northwest (towards Building 1434; see Section 3.2.25). Aerial photographs of the EBS subject site for circa 2001 and 1975-1976 are included as Appendix B and Appendix C, respectively (see Section 3.2.18).

Currently, 26 structures are located on the EBS subject site (see Table 2-1 and Table 2-2). Past and current uses of these buildings are shown in Table 2-1. Buildings 1301-1316 are currently utilized as greenhouses, laboratories, and storage space for USDA research. USAG DOIM utilizes Building 1422 for Installation information services. Building 1423 currently serves as administrative offices for USAMMA, AFMLO, and JRCAB. Additionally, a water tower and USDA agricultural fields are located on the western portion of the EBS subject site.

USAMRIID conducts research to develop defenses against known biological warfare agents and naturally occurring agents of potential military relevance. Building 1425, located south of the proposed site of the NBACC, is the largest USAMRIID facility. The building contains approximately 253,876 ft² of laboratories, administrative offices, and general and hazardous materials storage space (USAMRMC, 2001). Building 1412, also a USAMRIID facility, is an approximately 73,920-ft² laboratory that is primarily used for aerosol testing but also contains a non-human primate housing facility (USAMRMC, 2001). Buildings 1412 and 1425 were constructed on previously undeveloped land in 1958 and 1969-1972, respectively (Federline, 2002).

2.4 FUTURE USES OF THE SITE

The construction of the approved Integrated Research Facility (IRF) for the National Institute of Allergy and Infectious Diseases (NIAID) in the southern portion the EBS subject site will have a building footprint of approximately 75,000 ft.², and it will provide 150,000 gross square feet (gsf) of space. NIAID's focus on emerging infectious disease includes biodefense research, which entails understanding microbe pathogenesis, the human immune system response to them, and translating this knowledge into useful treatments, diagnostics, and vaccines. In addition, the construction of the proposed NBACC for the DHS is being considered for the NIBC at Fort Detrick. The proposed NBACC will have a building footprint of approximately 135,000 ft.², and its planned location is in the eastern portion of the EBS subject site (see Figure 2-5). The research missions of the proposed NBACC are to include biodefense characterization, bioforensics, and agrobioterrorism for homeland security. In addition to Biosafety Level-2 and -3 research laboratories, the proposed NBACC will contain Biosafety Level-4 laboratories. These facilities will be designed to prevent infectious microbes from being released into the environment and to provide the highest possible level of safety to scientists conducting experiments with infectious microbes.

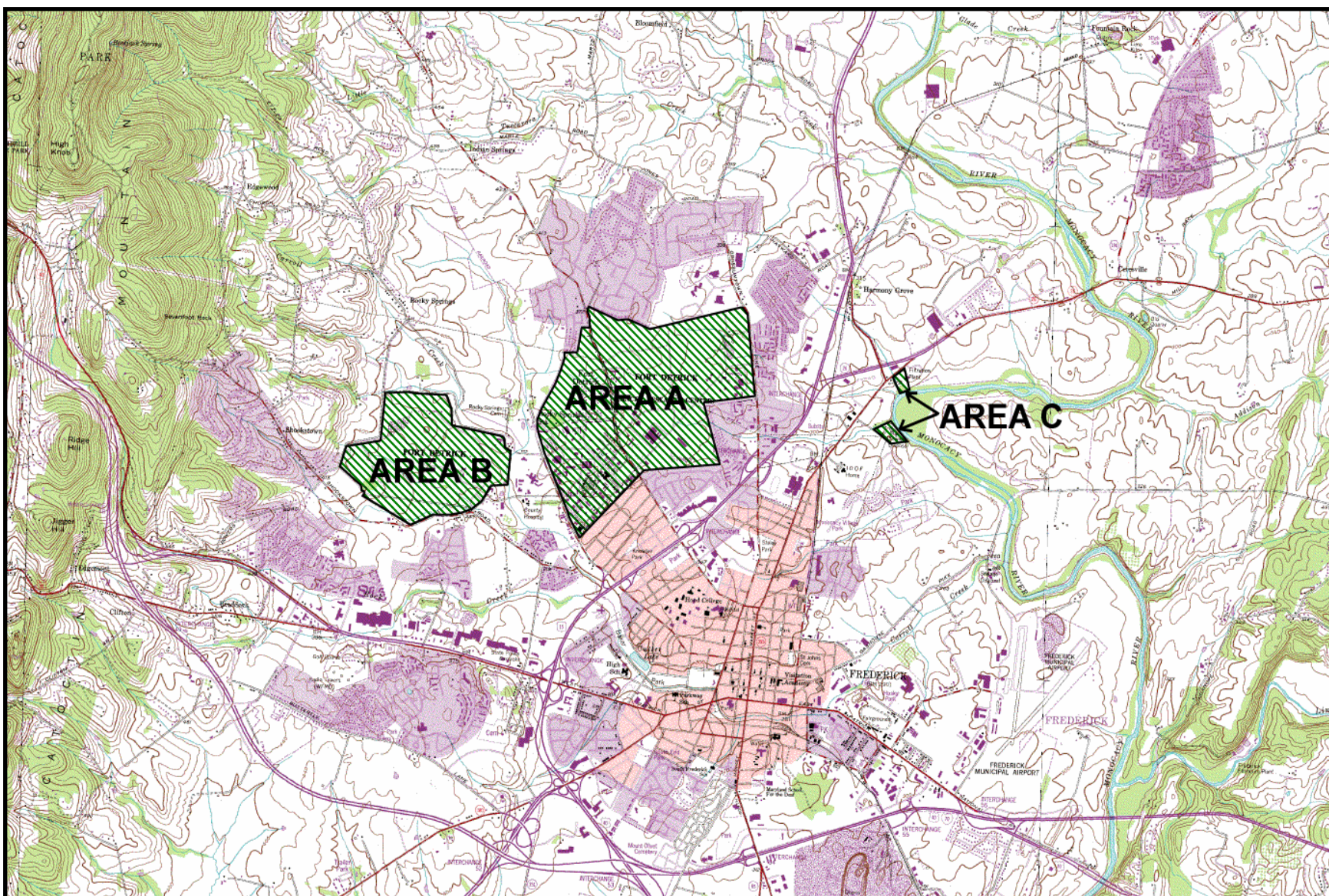


Figure 2-1. Area Location Map of Fort Detrick.

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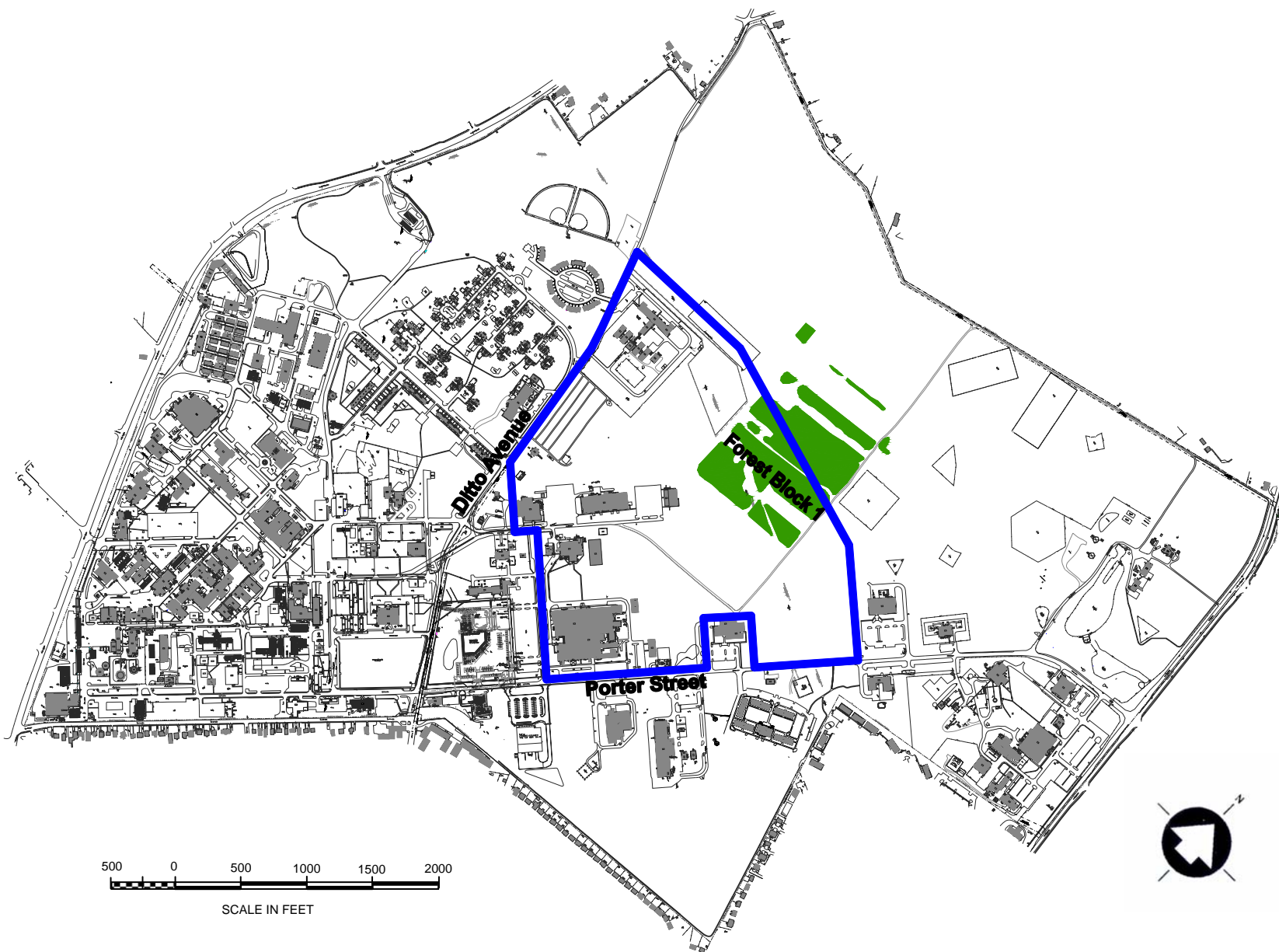
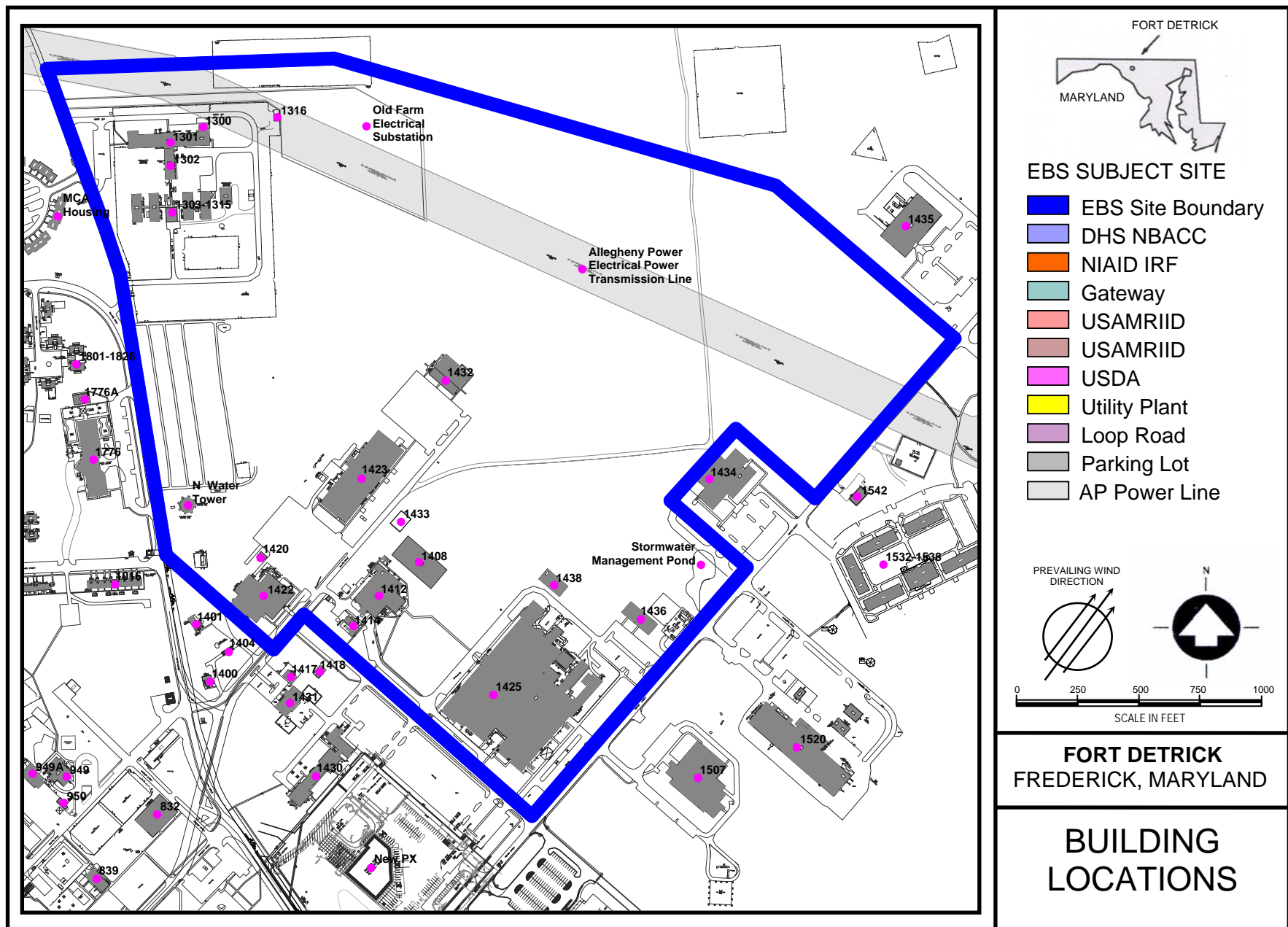


Figure 2-2. Location for the Southern Portion of the NIBC.

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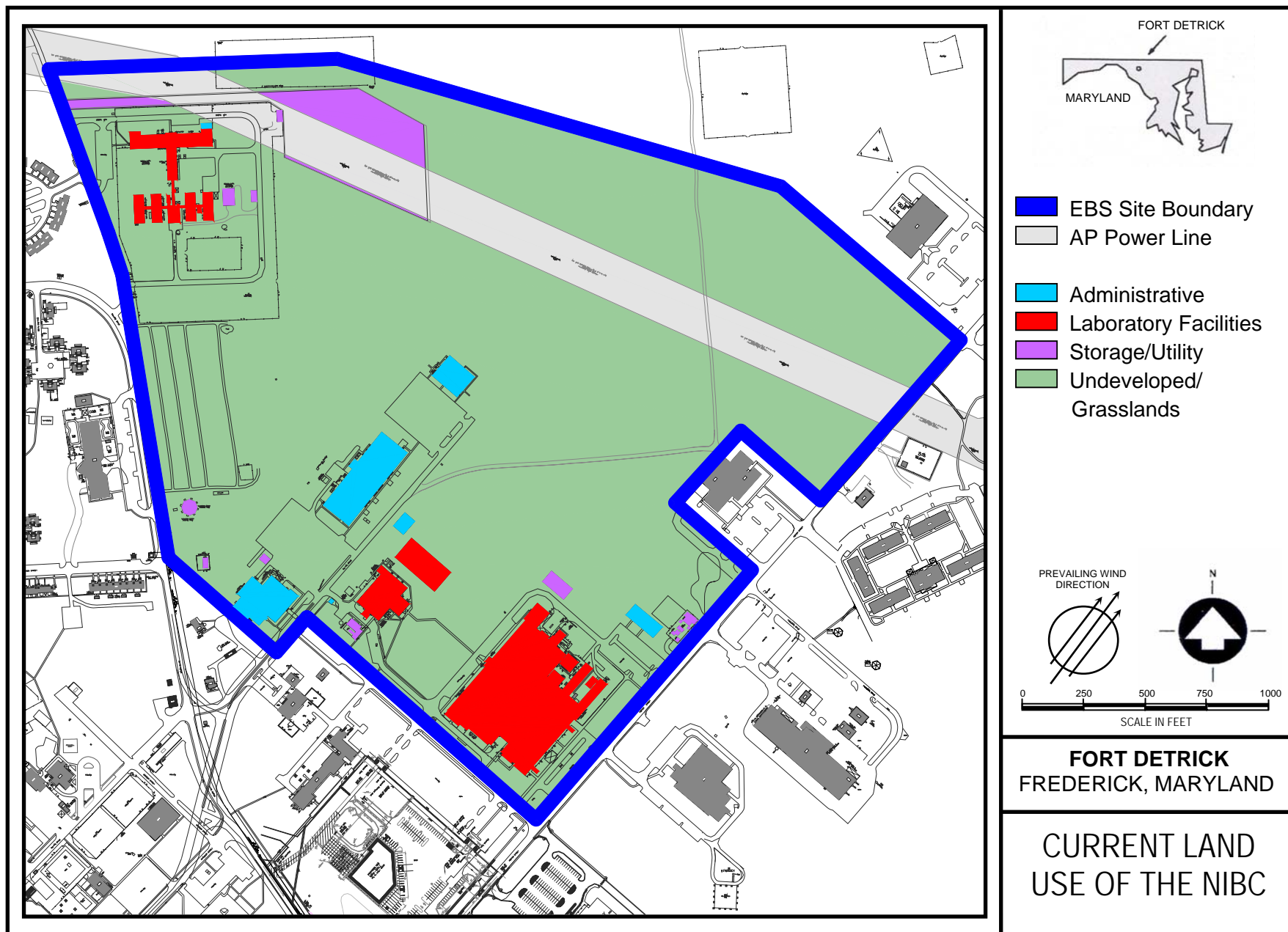


Figure 2-4. Usage of Existing Buildings on the Southern Portion of the NIBC.

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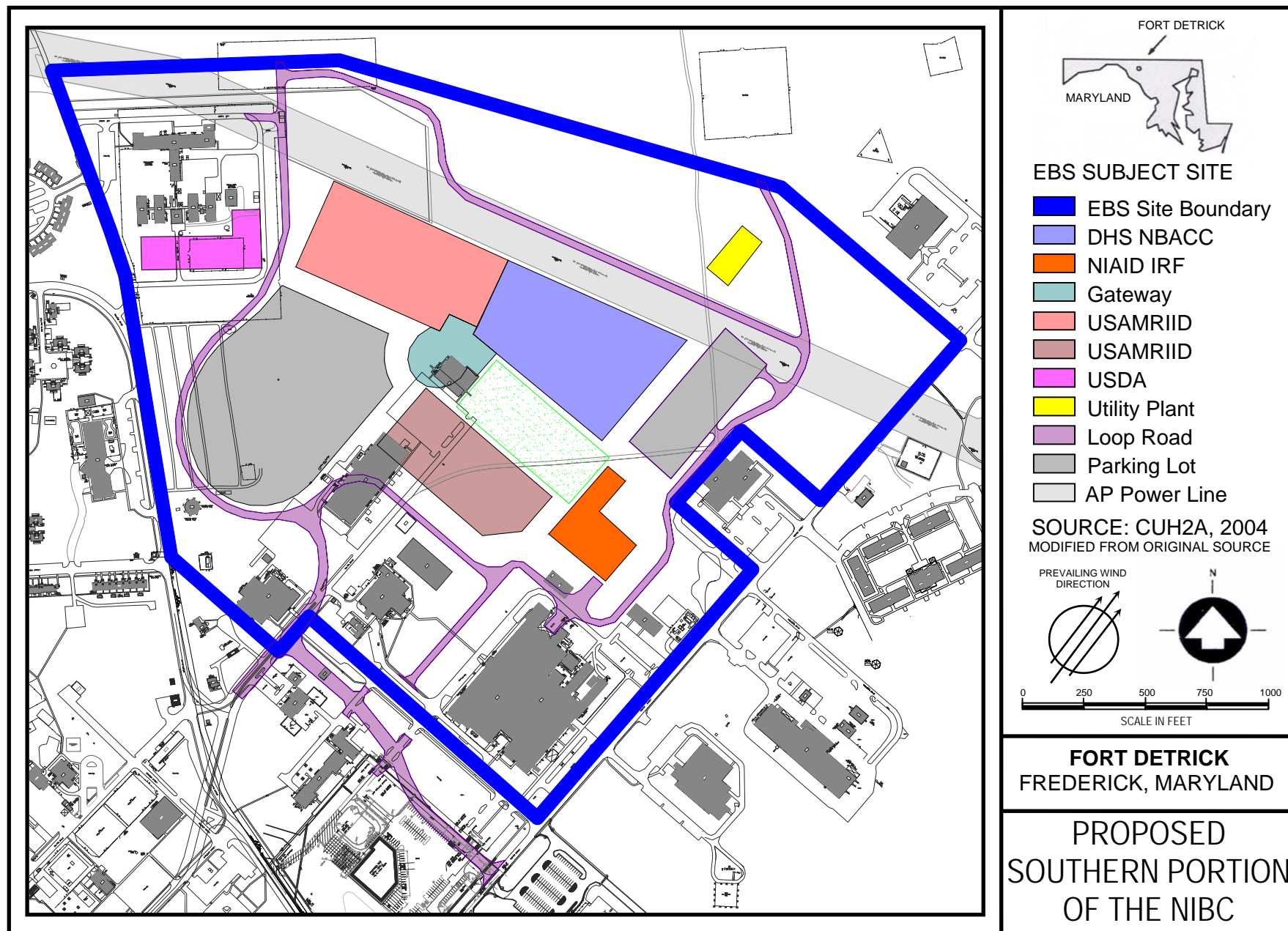


Figure 2-5. Proposed Site Layout for the Southern Portion of the NIBC.

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Table 2-1. Usage and Size of Existing Buildings on the Southern Portion of the NIBC.

Building Number	Year Built	Occupant	Usage			Gross Square Feet*
			Past	Current	Future	
1300	2001	USAMRIID	Administrative	Administrative	Administrative	864
1301	1956	USDA/USAMRIID	Laboratory	Laboratory	Laboratory	47,801
1302	1956	USDA	Greenhouse Laboratory	Greenhouse Laboratory	Greenhouse Laboratory	8,750
1303	1956	USDA	Greenhouse Laboratory	Greenhouse Laboratory	Greenhouse Laboratory	3,790
1304	1956	USDA	Greenhouse Laboratory	Greenhouse Laboratory	Greenhouse Laboratory	3,596
1305	1956	USDA	Greenhouse Laboratory	Greenhouse Laboratory	Greenhouse Laboratory	3,596
1306	1956	USDA	Greenhouse Laboratory	Greenhouse Laboratory	Greenhouse Laboratory	3,596
1307	1974	USDA	Greenhouse Laboratory	Greenhouse Laboratory	Greenhouse Laboratory	320
1308	1977	USDA	Storage	Storage	Storage	2,400
1309	1982	USDA	Greenhouse Laboratory	Greenhouse Laboratory	Greenhouse Laboratory	2,024
1312	1957	USDA	Greenhouse Laboratory	Greenhouse Laboratory	Greenhouse Laboratory	364
1313	1973	USDA	Storage	Storage	Storage	800
1315	1965	USDA	Greenhouse Laboratory	Greenhouse Laboratory	Greenhouse Laboratory	230
1316	1957	USDA	Storage	Storage	Demolition	-800

* A negative sign (-) indicates future demolition of building.

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Table 2-1. Usage and Size of Existing Buildings on the Southern Portion of the NIBC (cont.).

Building Number	Year Built	Occupant	Usage			Gross Square Feet*
			Past	Current	Future	
1408	2003	USAMRIID	Animal Facility (Under Construction)			13,000
1412	1958	USAMRIID	Laboratory	Laboratory	Demolition	-73,920
1414	1958	USAMRIID	Air Incinerator	Storage	Demolition	-2,643
1415	1959	Union	Access Control Facility (Guard Shack)	Union Office	Demolition	-177
1420	1997	USAG, DOIM	Standby Generator	Standby Generator	Standby Generator	728
1422	1963	USAG, DOIM	Computer Center	Computer Center	Computer Center	25,162
1423	1987	USAMMA/AFMLO/JRCAB	Administrative	Administrative	Demolition (Eventually)	-41,812
1425	1969	USAMRIID	Laboratory	Laboratory	Demolition	-253,876
1432	1994	USAMMA/AFMLO	Administrative	Administrative	Demolition (Eventually)	-12,480
1433	2002	Trailer being leased by IBM as part of a USAMMA contract	Administrative	Administrative	Removal at end of USAMMA contract with IBM	-2,867
1436	1998	Joint Vaccine Acquisition Program	Administrative	Administrative	Demolition	-6,780
1438	2002	USAMRIID	Storage	Storage	Demolition	-10,000
CURRENT BUILDINGS TOTAL						522,376
BUILDINGS TO BE DEMOLISHED TOTAL						-405,355
FUTURE BUILDINGS TOTAL						117,021

* A negative sign (-) indicates future demolition of building.

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Table 2-2. Future Status and Footprint of Buildings on the Southern Portion of the NIBC.

Existing Building Number	Future Status	Footprint (Square Feet)*
1300	Retained	864
1301	Retained	15,577
1302	Retained	3,868
1303	Retained	3,790
1304	Retained	3,596
1305	Retained	3,596
1306	Retained	3,596
1307	Retained	320
1308	Retained	2,400
1309	Retained	2,024
1312	Retained	364
1313	Retained	800
1315	Retained	230
1316	Demolition	-800
1408	Retained	13,000
1412	Demolition	-20,197
1414	Demolition	-1,855
1415	Demolition	-177
1420	Retained	728
1422	Retained	25,239
1423	Demolition	-41,976
1425	Demolition	-164,121
1432	Demolition	-11,941
1433	Demolition	-2,867
1436	Demolition	-6,780
1438	Demolition	-5,050
TOTAL EXISTING		335,756
TOTAL REMOVED		-255,764
NET EXISTING		79,992

* A negative sign (-) indicates future demolition of building.

Future uses of the 26 buildings currently located on the EBS subject site are shown in Table 2-1 and Table 2-2. According to current plans, a proposed Central Utility Plant will be located on the northeastern portion of the EBS subject site (see Figure 2-5). The stormwater management pond in the southeastern portion of the site is in the process of being reconfigured to allow for an extension of Freedman Drive, which intersects Porter Street just west of Building 1434. The eastern portion of the pond was filled and replaced with the road. However, the overall configuration of the pond may change based on the stormwater management study which is underway.

2.5 PAST AND CURRENT USES OF ADJOINING PROPERTIES

The southwestern half of Area A at Fort Detrick is characterized by dense development, while the northern portion is largely undeveloped land. The EBS subject site is located in the south-central portion of Area A. It is bordered to the north by undeveloped land (Forest Block 1), to the west by Ditto Avenue, and to the south by Porter Street. The boundary of the northeastern portion of the EBS subject site extends northeast of an electrical power transmission line right-of-way, approximately 70 ft. southwest of Building 1435.

Buildings immediately adjacent to the EBS subject site include Building 1435 (21st U.S. Army Signal Brigade) to the northeast, Building 1434 (Barquist Army Health Clinic) to the east, and housing and community support facilities to the southeast, south, southwest, and west. Buildings 1400, 1401, and 1404 (located immediately southwest of Building 1422) are currently utilized for USAG family housing and a garage (see Figure 2-3 and Figure 2-6).

The Barquist Army Health Clinic (Building 1434), which was opened in 2000, neighbors the EBS subject site to the east. Prior to the construction of the roughly 26,000-ft.² facility, the site was undeveloped. The new health clinic consolidates various health services, which were previously housed in separate buildings around Fort Detrick. The clinic provides standard primary care services and specialty services, such as cardiology, optometry, and travel medicine. Other services include an in-house pharmacy, a laboratory, and a radiology department (USAG, 2002a).



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3.0 ENVIRONMENTAL RECORDS REVIEW

3.1 STANDARD ENVIRONMENTAL RECORD SOURCES

3.1.1 USEPA National Priorities List (NPL)

The USEPA NPL is a listing of sites with known environmental or health hazards that are being investigated or are undergoing remediation under the Federal Superfund program. No sites at Fort Detrick are listed on the NPL (USEPA, Office of Superfund Remediation and Technology Innovation, 2003). The Maryland Department of the Environment (MDE) is the lead regulatory agency for environmental restoration sites at Fort Detrick. USEPA Region III is a part of an environmental partnership between the U.S. Army Environmental Center (USAEC), U.S. Army Corps of Engineers (USACE), USEPA, and MDE. These organizations work together to promote environmental restoration in a safe, expeditious, and cost-effective manner (Gortva, 2004d).

3.1.2 Department of Defense, Army Environmental Database Restoration (AEDB-R)

The AEDB-R program (formerly the Defense Site Environmental Restoration Tracking System [DSERTS] database) manages data for sites on installations that are of possible environmental concern and prescribes appropriate actions to achieve environmental restoration. Fort Detrick has 41 sites listed in the AEDB-R; 27 of them located in Area A. Twenty-five of the 27 sites have completed the required response actions; therefore, they require no further action (USAG, Environmental Management Division, 2001). The remaining two sites in Area A, which are considered “remedy-in-place,” are the water towers site and the Building 568 trichloroethylene (TCE) spill site. The locations of these known contamination sites are shown in Appendix D.

Water Towers

Three water towers are located in Area A: the west water tower, the south water tower, and the north water tower. A Remedial Investigation (RI) detected lead concentrations above maximum background levels and USEPA residential and industrial screening levels throughout the soil surrounding each of the water towers. The elevated levels of lead were attributed to the weathering and sandblasting of lead-based paint covering the water towers. In addition, a few isolated samples also showed elevated thallium and iron concentrations (USACE, 2000a). However, a human health risk assessment (HHRA) for the water towers site concluded that non-residential use of the three sub-sites does not pose an elevated risk of adverse effects on human health and recommended no further remedial action for this site (USACE, 2000b).

The north water tower is located within the western portion of the EBS subject site (Appendix D). The north water tower is designated as ECP Classification 3 (areas where release, disposal, and/or migration of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action). The other two water towers are outside the EBS subject site.

Building 568 TCE Spill Site

The Building 568 TCE spill site is located approximately 1,440 ft. southwest of the EBS subject site (see Appendix D). Elevated levels of TCE in groundwater near Building 568 were first detected during routine groundwater sampling in 1987. The contamination was attributed to an undocumented release of an unknown quantity of TCE at the east side of Building 568, believed

to have occurred sometime between 1953 and 1970. Groundwater in the area of the TCE spill flows in a southwesterly direction. This suggests that TCE-contaminated water did not and likely will not migrate onto the EBS subject site (USACE, 2000a). The remedial investigation and required response actions were completed for this site; however, long-term groundwater monitoring is to continue.

3.1.3 USEPA Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) List

The USEPA CERCLIS database was established to support the Superfund program and contains comprehensive information on known and potential hazardous waste sites. The CERCLIS database shows two listings in Area A of Fort Detrick: one listing for the National Cancer Institute (NCI)-Frederick, due to past disposal practices, and a site-wide listing for Fort Detrick in general. Both of these listings were entered into the CERCLIS in 1980 as potential hazardous waste sites. A CERCLIS listing is not necessarily related to known contamination or to a particular incident or spill (Baker, 2002).

The NCI complex is located in the southwestern portion of Area A. A preliminary assessment for the NCI site was initially conducted in February 1992. A preliminary assessment for Fort Detrick in general was completed in November 1993, and a site inspection was conducted in December 1994. Following this site inspection, the priority level for the site was downgraded from high to low, and no further action was deemed necessary (USEPA, Office of Superfund Remediation and Technology Innovation, 2003).

3.1.4 USEPA Resource Conservation and Recovery Information System (RCRIS) List

Fort Detrick and NCI-Frederick are listed as large quantity generators of hazardous waste in the RCRIS database. According to the most recent National Biennial Resource Conservation and Recovery Act (RCRA) Hazardous Waste Report (USEPA, 2001), Fort Detrick generated 27.23 tons of hazardous waste and 337 pounds (lbs) of acute hazardous waste in 1999. Acute hazardous waste is defined as fatal to humans in low doses (40 CFR 261.11). NCI-Frederick generated 46.97 tons of hazardous waste and 24.03 lbs of acute hazardous waste in 1999 (USEPA, 2001). According to USAG records, a total of 8.35 tons (16,706 lbs) of RCRA hazardous waste were generated in 2003 on Area A at Fort Detrick (Leadore, 2004). Neither Fort Detrick nor NCI-Frederick are listed as a RCRIS transporter or treatment, storage, or disposal facility (USEPA, 2002a).

3.1.5 USEPA National Response Center (NRC) List

The NRC database, formerly known as the Emergency Response Notification System database, indicates that a total of four incidents occurred in Area A of Fort Detrick during the time period of 08 January 2002 through 11 February 2004 (NRC, 2004).

On 08 January 2002 (Incident Report [IR] No. 590485), 0.5 quart of an unknown oil spilled onto the concrete pad from a container while it was being poured into a car at the Service Station (Building 950). On 15 June 2002 (IR No. 611503), four gallons of used motor oil were spilled on the ground at Building 1431 while the oil was being transferred from a 55-gallon drum to an aboveground storage tank (AST). Building 1431 is located approximately 50 ft. from the southern boundary of the EBS subject site. On 07 January 2004 (IR No. 709881), 120 gallons of No. 6 fuel oil were spilled onto the concrete and a grassy area at Building 190. The fuel overflowed from an underground "day tank" due to an operator error. Finally, on 11 February

2004 (IR No. 713130), five gallons of No. 6 fuel oil were spilled from a tanker truck onto the asphalt at Building 190. All of the aforementioned releases of materials were secured, and the cleanups are completed (NRC, 2004).

In addition to the above incidents from the NRC database, the following petroleum spills also recently occurred in Area A of Fort Detrick, as documented by USAG personnel (Lewis, 2004a):

- 17 August 2002, Main Gate, less than one pint of motor oil
- 20 August 2002, Building 1431, less than one pint of transmission fluid
- 10 March 2003, Building 1671, one pint of lube oil
- 12 March 2003, Building 950, less than one gallon of gasoline
- 24 April 2003, Building 1520, less than one gallon of diesel
- 21 July 2003, Building 810, one quart of diesel fuel
- 10 February 2004, Electrical Contractor Staging Area (north of Building 1301), five gallons of transformer oil.
- 25 February 2004, Building 1431, one pint of transmission fluid

On 10 February 2004, USAG personnel observed a pole-mounted-type transformer lying on its side within the Electrical Contractor Staging Area for the Allegheny Power (Old Farm) electrical substation (see above bullet). The Electrical Contractor Staging Area is located north of Building 1301 on the EBS subject site (see Appendix D). The transformer was transported on site by an Allegheny Power subcontractor on an unknown date. Approximately three gallons of oil remained within the transformer (8-gallon total capacity). It was assumed that approximately five gallons of potentially polychlorinated biphenyl (PCB)-contaminated oil had leaked to the environment. Visual observations determined that the oil was concentrated in the immediate vicinity of the leaking transformer. The Fort Detrick Fire Department responded to the spill and collected a sample of the transformer oil. The transformer was placed in an overpack drum for off-site disposal by Allegheny Power. Initial field screening of the transformer oil indicated less than 50 parts per million (ppm) of PCBs. Follow-up laboratory analysis of the transformer oil verified PCB concentrations of less than 50 ppm. Approximately 30 gallons of soil in the immediate area of the spill was removed and placed in a 55-gallon drum and transported to the Fort Detrick Hazardous Material Management Office (HMMO) for storage and future disposal. Upon receipt of laboratory analytical results indicating non-hazardous characteristics, the soil was transferred to the Fort Detrick incinerator for disposal (Lewis, 2004b). This area is designated as ECP Classification 2 (areas where only release or disposal of petroleum products has occurred).

According to historical records, a spill occurred on 04 February 1993 at Building 190, which is located approximately 2,850 ft. southwest of the EBS subject site. Approximately 10 gallons of No. 6 fuel oil were released from a pump or air lock due to equipment failure. Sorbent pads were used to clean up the spill (NRC, 2002). Another spill occurred on 01 June 2000 and extended from the Main Gate to Building 459 in the existing NCI complex. Approximately five gallons of No. 2-D fuel oil were released from a delivery truck due to a broken fuel line or pump. Sorbent pads were used to clean up the spill (NRC, 2002). The main gate is located

approximately 800 ft. southwest of the EBS subject site. Building 459 is located approximately 2,210 ft. west of the EBS subject site.

Finally, a release of anthrax bacteria (*Bacillus anthracis*) occurred at a laboratory within Building 1425 (the main research facility of USAMRIID), located in the southern portion of the EBS subject site. According to a USAMRIID news release, a scientist working in one of the facility's Biosafety Level-3 laboratories discovered a suspicious deposit on a flask and initiated sampling of the area on 08 April 2002. Low levels of anthrax spores were subsequently found in a hallway outside the laboratory, and nasal swab testing of one of two employees working in the laboratory was positive for exposure to anthrax spores. Evaluation by USAMRIID revealed that the contamination was localized and due to a breach of lab procedures (Center for Infectious Disease [CID], 2002). Following the discovery of the release, approximately 100 employees, who work in the vicinity of the affected area, were temporarily relocated and all potentially contaminated areas were disinfected with bleach. Normal operations resumed, and the facility was declared to be safe as of 22 April 2002 (CID, 2002). This area is designated as ECP Classification 4 (areas where release, disposal, and/or migration of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken).

3.1.6 USEPA Facility Index System (FINDS)

The USEPA's FINDS database is a listing of the names, addresses, and ID numbers of all facilities regulated by the USEPA. Area A is listed in the FINDS database with the USEPA identification number of MD0000774356 (Right-to-Know Network, 2003).

3.1.7 Corrective Action Report Listing

The RCRA corrective action activity (CORRACTS) database does not list Fort Detrick as undergoing any corrective action under RCRA (USEPA, 2002b and 2002c).

3.1.8 Permitted Solid Waste Disposal Facilities

The only permitted solid waste disposal facility located in Area A of Fort Detrick is the incinerator plant (USAG, 2003). The incinerator plant consists of two medical waste incinerators and two municipal waste incinerators. The municipal waste incinerators (B-1 and B-4) operate under permit-to-operate (PTO) 2000-WIN-0341, and the medical waste incinerators (B-5 and B-6) operate under PTO 24-021-00131 (Wolf, 2004). The incinerator plant burns waste from the Installation, and the resultant ash is hauled by truck to the active landfill at Area B (Dressler, 2002). The incinerator plant is located in Building 393, approximately 2,360 ft. west of the EBS subject site.

3.1.9 Leaking Underground Tank Listing

There are no known leaking underground storage tank (LUST) sites on the southern portion of the NIBC (Adkins, 2002a). However, LUSTs were discovered near Building 190 (Boiler Plant), approximately 2,850 ft. southwest of the EBS subject site, and around Building 950 (Service Station), approximately 620 ft. west of the EBS subject site (see Appendix D).

Building 190 Fuel Oil Spill

Building 190 houses the Fort Detrick boiler plant, which commenced operation in the 1950s. The plant operates four boilers, two of which are fueled by natural gas and two by No. 6 fuel oil.

A tank farm consisting of ten 53,000-gallon No. 6 fuel oil underground storage tanks (USTs) was installed adjoining Building 190 between 1954 and 1956. In 1967, a 650,000-gallon No. 6 fuel oil AST was set up adjacent to the UST tank farm (USACE, 2002a).

When the site of the tank farm was characterized to select the location for an additional 250,000-gallon No. 6 fuel oil AST in 1994, traces of No. 6 fuel oil were found in three out of four boreholes (USACE, 2002a). The ten USTs were removed in early 1995, and according to the MDE records, several of them were leaking and free-phase petroleum product was observed floating on the water surface (MDE, 1999). Following these observations, groundwater monitoring was initiated to assess the extent of free-phase No. 6 fuel oil in the aquifer, and a Corrective Action Plan (CAP) was established (USACE, 1999). In addition, a fuel oil recovery system was installed near Building 190 to meet MDE cleanup requirements. The recovery well has yielded over 60 gallons of No. 6 fuel oil since March 2000 (USACE, 2002a).

A 2002 map shows that oil contamination in the groundwater does not extend as far as the EBS subject site (see Appendix D). Contamination extends as far east as Schertz Street (USACE, 2002b), which runs north-south, approximately 3,400 ft. west of the EBS subject site. In addition, groundwater in the area of the fuel oil leak flows to the southwest. Therefore, oil contamination due to leaking USTs at Building 190 likely did not impact the EBS subject site.

Building 950 Gasoline Fuel Leaks

Two other LUST sites were discovered in 1991 and 1993 around the Service Station (Building 950). In 1991 a 12,000-gallon gasoline UST was discovered to have leaked approximately 3,900 gallons of unleaded gasoline. This tank was located adjacent to Buildings 940 and 901 (see Appendix D). Subsequently, groundwater monitoring wells were installed in Buildings 940 and 950 to assess the extent of groundwater contamination from the leak.

In April 1993, a leak of 400 gallons of gasoline was reported at the existing Fort Detrick service station, and in June, five, 8,000-gallon gasoline USTs were excavated. Several perforations in the tanks were noted, as was contamination of the soil surrounding the tanks. Six monitoring wells were installed near Building 950. Samples from the wells in 1995 and 1998 showed high concentrations of gasoline-related volatile organic compounds (VOCs). In 2001, groundwater monitoring results showed that the contamination levels surrounding Building 950 were decreasing. It was recommended to close the monitoring wells because the leakage site is capped with pavement and that natural attenuation appears to be occurring (USAG, 2003).

3.1.10 Underground Storage Tanks

Currently, there are 11 permitted USTs at Fort Detrick, and all of them are registered with MDE. None of these permitted USTs are located on the southern portion of the NIBC. The USTs closest to the EBS subject site are three gasoline tanks with a capacity of 8,000 gallons each (see Table 3-1). These tanks are located by Building 950, approximately 620 ft. west of the EBS subject site (Gortva, 2002a). These USTs are 2-wall fiber glass tanks and feature overfill- and spill-protection devices. The tanks were installed in 1993 (USAG, 2003). All 11 USTs are operated in accordance with all Federal and MDE regulations (Gortva, 2002a).

Table 3-1. USTs within 2,000 ft. of the EBS Subject Site.

Location (Building Number)	Capacity (gallons)	Contents	Installation Date	Approximate Distance to EBS Subject Site (feet)	Approximate Direction from EBS Subject Site
950	8,000	Gasoline	1993	620	West
950	8,000	Gasoline	1993	620	West
950	8,000	Gasoline	1993	620	West
1673	30,000	No. 2 Oil	1986	1,200	Northeast
1673	30,000	No. 2 Oil	1986	1,200	Northeast
1673	30,000	No. 2 Oil	1986	1,200	Northeast
1673	30,000	Diesel	1986	1,200	Northeast
1673	30,000	Diesel	1986	1,200	Northeast

3.1.11 Aboveground Storage Tanks

Currently, there are 33 permitted ASTs at Fort Detrick. Six ASTs are located on the EBS subject site. There are no known leaks associated with the ASTs on the EBS subject site (Gortva, 2004c). Table 3-2 provides the location, capacity, contents, and installation date of all ASTs within 2,000 ft. of the EBS subject site (Gortva, 2004a). A Spill Prevention Control and Countermeasure Plan is described in the Integrated Contingency Plan (dated 12 September 2002) that applies to all USTs and ASTs on the Installation. These plans are periodically updated to address the installation of any new tanks (Gortva, 2002a).

Three ASTs are located near Building 1425 in the southern portion of the EBS subject site. All three tanks hold No. 2 diesel fuel and were installed in 1992. The largest tank, which has a capacity of 3,000 gallons, is located inside the building. This tank features secondary containment. The other two tanks at this location are small tanks with 100 gallons and 350 gallons capacity (USAG, 1998).

3.2 PHYSICAL SETTING

3.2.1 Topography

The site of the southern portion of the NIBC appears on the USGS 7.5-minute series topographic quadrangle map of Frederick, Maryland (see Appendix E). The 1993 photo-revised USGS topographic map of this quadrangle was reviewed for information about the topography and vicinity of the site. A review of this map indicates that Fort Detrick ranges in elevation from 320 ft. to more than 400 ft. above sea level (USGS, 1993). The EBS subject site ranges in elevation from approximately 348 ft. to 380 ft. above sea level. Most of the site slopes from the northwest to southeast (DIS, 2001).

3.2.2 Geology

The regional geology underlying Area A is the fractured limestone and dolomite of the Upper Cambrian Frederick Formation, which consists of the Lime Kiln, Rocky Springs Station, and Adamstown members (see Appendix F). The Frederick Formation has been known to develop karst features such as sinkholes. Specifically, Area A is bisected by the contact between the

Table 3-2. ASTs within 2,000 ft. of the EBS Subject Site.

Location (Building Number)	Capacity (gallons)	Contents	Installation Date	Approximate Distance to EBS Subject Site (feet)*	Approximate Direction within/from EBS Subject Site
1414	1,000	No. 2 Oil	2003	N/A	Southwest Portion
1420	1,500	No. 2 Oil	1996	N/A	Southwest Portion
1420	100	No. 2 Oil	Unknown	N/A	Southwest Portion
1425	3,000	No. 2 Diesel	1992	N/A	Southern Portion
1425	350	No. 2 Diesel	1992	N/A	Southern Portion
1425	100	No. 2 Diesel	1992	N/A	Southern Portion
1431	1,000	Used Oil	1993	120	Southwest
1504	330	Oil	1992	270	South
1692	1,000	Liquefied Petroleum Gas	Unknown	820	Northeast
810	500	No. 2 Diesel	1995	1,060	Southwest
1673	300	No. 2 Oil	1993	1,230	Northeast
1673	300	No. 2 Oil	1993	1,230	Northeast
1673	300	No. 2 Oil	1993	1,230	Northeast
1673	300	No. 2 Oil	1993	1,230	Northeast
1673	550	Used Oil	1993	1,230	Northeast
1673	1,000	Lube Oil	Unknown	1,230	Northeast
1076	1,000	Liquefied Petroleum Gas	Unknown	1,510	West
567	280	Diesel	Unknown	1,600	Southwest
571	185	Diesel	Unknown	1,630	Southwest

* N/A indicates AST is located within the EBS subject site.

Rocky Springs Station Member (western portion) and the Adamstown Member (eastern portion). The majority of the EBS subject site is underlain by the Adamstown Member, a fine-grained, thin-bedded, dark gray limestone (USAG, 2003). The northwest corner of the EBS subject site, adjacent to Buildings 1301-1313, is underlain by the Rocky Springs Station Member, a thinly-bedded limestone containing dolomite and layers of coarse quartz sand (USAG, 2003).

Fort Detrick is located within a Seismic Zone 1 area with seismic coefficients ranging from 0.03 to 0.07. Seismic coefficients, in general, range from 0.0 to 0.27, with high values indicating high risk of earthquake. Seismic Zone 1 is characterized as an area that may receive minor damage due to distant earthquakes (USACE, 1998). Nearly all of Maryland, including Frederick County, is classified as a "region of negligible seismicity with very low probability of collapse of the structure." In other words, it is not necessary to include seismic considerations in the design of new structures (Maryland Geological Survey, 2002).

3.2.3 Sinkholes and Depressions

Sinkholes are known to develop in the Frederick Formation. These circular depressions in the landscape are created when groundwater dissolves the underlying limestone and the resulting

cavity collapses. Construction over closed depressions may increase the potential for a sinkhole collapse. Also, because sinkholes can accelerate surface water and contaminant entry into an aquifer, they can become gateways for groundwater contamination (USACE, 2002b). Based on interpretation of aerial photographs and USGS quadrangle maps for topographic characteristics, vegetation, and soil tone, several sinkholes/depressions have been identified on or near Area A of Fort Detrick. One sinkhole, covering an area of approximately 2.7 acres (115,720 ft.²), is located in the northwestern portion of the EBS subject site (see Appendix G; USACE, 2001). More detailed geotechnical studies would be required to determine if the EBS subject site has potential for sinkhole development not apparent from the USACE study (2001).

3.2.4 Fracture Traces and Lineaments

Fracture traces and lineaments are linear features that may suggest the presence of natural, geologic features, such as faults and joints; or they may reflect man-made structures, such as fence lines, or drainage ditches (USACE, 2001). Subterranean fracture traces that are connected to the aquifer may represent pathways for groundwater flow and influence the regional groundwater flow regime (USACE, 2002b). A photogeologic analysis of fracture traces in Area A identified a total of seven fracture traces on the EBS subject site (see Appendix G; USACE, 2001).

The seven fracture traces that are located within or extend onto the EBS subject site are labeled in Appendix G. Fracture trace No. 1, located directly on the proposed site of the NBACC, is approximately 630 ft. long and runs west to east in the central portion of the EBS subject site. Fracture trace No. 2, which is approximately 1,604 ft. long in a zigzag pattern, extends 400 ft. onto the eastern portion of the EBS subject site. Fracture traces No. 3 and No. 4, which are approximately 1,212 ft. and 768 ft. in length, respectively, run west to east and extend onto the northeastern portion of the EBS subject site. Fracture trace No. 5, which is approximately 852 ft. long, originates south of Building 1425, enters the southeastern portion of the EBS subject site, and continues northeast onto the site for approximately 472 ft. Fracture trace No. 6, which is approximately 2,437 ft. long, is located directly on the USDA complex. This fracture trace extends 1,145 ft. onto the northwestern portion of the EBS subject site. Finally, fracture trace No. 7, which is approximately 1,261 ft. in length, enters the northeastern portion of the EBS subject site and extends 403 ft. onto the site (USACE, 2001).

3.2.5 Soils

Two soil series, Duffield and Adamstown, are found on the EBS subject site (see Appendix F). The Duffield series consists of very deep, well-drained soils with moderate permeability. Duffield soils, predominantly silt loams, are present throughout the majority of EBS subject site (USDA, 2002). The Duffield soils throughout the northern portion of the EBS subject site are characteristic of karst landscapes with a potential for sinkhole development (USDA, 2002). The Adamstown series consists of very deep, moderately well-drained soils with slow or moderately slow permeability. Adamstown soils are present in the eastern portion of the EBS subject site (USDA, 2002). Soils in the above series are fertile, highly productive, easy to manage, and have the ability to support a variety of vegetation (USACE, 2000b; Soil Conservation Service, 1956). The general slope of soils on the EBS subject site ranges between 0 and 8 percent (USAG, 1998).

3.2.6 *Surface Water Resources*

Fort Detrick is located within the Monocacy River Drainage Basin. The Monocacy River, which forms a sub-basin of the Middle Potomac River Basin, ranges from 40 to 375 ft. in width and from 0.5 to 18 ft. in depth. This major stream originates at the Maryland-Pennsylvania border and flows south to the east of Fort Detrick until it joins the Potomac River approximately 15 miles south of the City of Frederick. Area A of Fort Detrick is located approximately 1.5 miles to the west of the Monocacy River (USAG, 2003). Stream discharge rates of the Monocacy River near Fort Detrick are obtained from measurements collected at the Jug Bridge gauging station, located approximately five miles southeast of Area A (USGS, 2000). Based on 74 years of record (1929 to 2003), daily mean flow recorded at this station has ranged from a minimum of 19 cubic feet per second (cfs; 12 million gallons per day [mgd]) to a maximum of 73,873 cfs (47,742 mgd). The average annual stream flow for this period of record was 938 cfs (606 mgd; USGS, 2003).

The Monocacy River is the sole water supply source for Fort Detrick. Additionally, the City of Frederick obtains approximately 28 percent of its drinking water supply (an average of 1.93 mgd) from the Monocacy River (Seal, 2002). The Installation's water treatment plant holds MDE Water Allocation Permit FR43S001(02), which authorizes withdrawal of water from the Monocacy River at rates up to a daily average of 2.0 mgd or 2.5 mgd daily maximum. This permit expires in 2012 (Fort Detrick Environmental Office, 2002; Silvestri, 2002a). Fort Detrick currently diverts water at an average rate of about 1.5 mgd during the summer and 1.3 mgd (approximately 2.0 cfs) at other times (Grams, 2002; Spears, 2002b). The Installation provides drinking water that meets or exceeds all Federal, State (i.e., Code of Maryland Regulations (COMAR) 26.04.01), and Department of the Army (DA) criteria (Grams, 2002). The anticipated consumption of water by the proposed NBACC is likely to be a very minor portion of the total water consumption of the Installation.

Surface water sources at Area A include the Nallin Farm Pond, two unnamed tributaries of the Monocacy River, three stormwater management ponds, and one holding water pond. A recently constructed stormwater management pond is located in the southeastern portion of the EBS subject site (see Figure 2-3). This pond was built in 1998/1999, but it is in the process of being reconfigured to allow for an extension of Freedman Drive (Boyland, 2002; Silvestri, 2002b). It is unlikely that the stormwater management pond will be part of any real estate action related to the NIBC.

3.2.7 *Stormwater*

In general, stormwater from the western and central portions of Area A drains into Carroll Creek. Stormwater from the eastern portion of Area A generally flows into the Monocacy River. Most of the stormwater in Area A is diverted through a system of surface ditches, inlets, culverts, and storm sewer lines. Surface water runoff from the southern portion of the NIBC will drain southeast towards the small stormwater management pond in the southeastern portion of the EBS subject site (USGS, 1993; USAG, et. al., 2000; DA, Directorate of Installation Services (DIS), 2001) (see Figure 2-3 and Appendix E). Surface water runoff from the northwestern portion of the NIBC, approximately 40 acres, will drain westward (see Appendix E). The current stormwater management system in this part of Area A is believed to be adequate. However, it will likely need to be reevaluated since the proportion of impervious surface area within the 124.1-acre subject site will increase from approximately 12.4 percent (15.4 acres) to approximately 32.5 percent (40.3 acres) after construction of the entire NIBC is complete. A regional stormwater management plan for the entire south-central portion of Area A may be

required in the future. A study evaluating stormwater management options for the site is underway.

3.2.8 Drinking Water

Fort Detrick owns and maintains the Installation water distribution system. Source water is withdrawn from the Monocacy River and is processed through the Fort Detrick Water Treatment Plant (WTP) located in Area C approximately 1.5 miles to the east of Area A. The State of Maryland permits Fort Detrick to withdraw up to a daily average of 2.0 mgd of water with a maximum daily withdrawal of 2.5 mgd from the Monocacy River. This water allocation permit, No. FR43S001 (02) expires in 2012 (Fort Detrick Environmental Office, 2002; Silvestri, 2002b). Fort Detrick relies on the Monocacy River as its sole source for drinking water and diverts water to its WTP at an average rate of about 1.3 to 1.5 mgd (Grams, 2003).

The Fort Detrick WTP has the capability to produce 4.25 mgd of finished water; however, due to the size of the existing distribution pipes, the WTP can only provide a maximum of 3.1 mgd of finished water without increasing the water pressure for distribution (Potter, 2003). Normally, 0.8 to 2.5 mgd of finished water is consumed at Fort Detrick, with approximately 473 million gallons of drinking water being consumed in fiscal year 2002 (Grams, 2003; Spears, 2002a). The Installation provides drinking water that meets or exceeds all Federal, State (i.e., COMAR 26.04.01), and DA criteria (Grams, 2002).

3.2.9 Wastewater

All of the wastewater generated within the Installation is discharged to the sanitary sewer system and pumped to the Fort Detrick Wastewater Treatment Plant (WWTP) in Area C. The WWTP operates at 40 to 50 percent of its capacity of 2.0 mgd as of 2002 (Grams, 2002). The wastewater is treated and then discharged into the Monocacy River at a point downstream from both the Fort Detrick and the City of Frederick water treatment plants. This discharge is subject to Permit MD0020877, issued by MDE under the National Pollutant Discharge Elimination System (NPDES). The current permit was valid through 31 August 2003 (USAG, 2003; Fort Detrick Environmental Office, 2002). The application for renewal of the NPDES permit is currently pending.

3.2.10 Groundwater

The Frederick area of the Piedmont Plateau Physiographic Province has the most productive hard rock aquifers within the State of Maryland. These aquifers have generally good water quality, and approximately 20 percent of these formations have the potential to yield at least 50 gpm of water (Maryland Office of Environmental Programs, 1986). Groundwater is transported through the carbonate aquifers via bedding planes, fractures, joints, faults, and other partings that have been enlarged by the dissolution of the carbonate bedrock (Trapp and Horn, 1997). The Fort Detrick Photogeologic Analysis (USACE, 2001) indicates numerous fracture traces and lineament features on Area A that could serve as potential conduits for groundwater contamination (Maryland Office of Environmental Programs, 1986). See Section 3.2.4.

Wells in the Frederick Limestone typically yield 120 to 170 gpm (Trapp and Horn, 1997). However, groundwater at Area A is not used for human consumption. Fort Detrick residents obtain their drinking water supply from the Monocacy River (USACE, 2000a). The remedial investigation and required response actions for the Building 568 TCE spill site are completed; however, long-term groundwater monitoring at this location will continue (Gortva, 2003a). As stated in Section 3.1.2, groundwater in the area of the TCE spill flows in a southwesterly

direction. This suggests that TCE-contaminated water did not and likely will not migrate onto the EBS subject site (USACE, 2000a).

3.2.11 Wetlands

A wetlands inventory for Fort Detrick, conducted by the U.S. Fish and Wildlife Service (USFWS) in 1999, identified three wetland areas in Area A –all of which are located in the northeastern portion of the Installation (USFWS, 1999). Wetland area W-5 is located approximately 1,750 ft. northeast of the EBS subject site (see Appendix H). The closest wetland to the EBS subject site, which is located west of the Nallin Farm Pond, lies approximately 1,330 ft. to the northeast.

3.2.12 Plant and Animal Ecology

Most of the ecosystems at Fort Detrick have been highly altered by urbanization and human activities. The EBS subject site is largely undeveloped grassland, which is mowed weekly by a contractor (Boyland, 2002). Large portions of Area A are maintained as open fields. Dominant grass species in the area are alfalfa (*Medicago sativa*), tall fescue (*Festuca arundinacea*), and brome grass (*Bromus sp.*) (USAG, 2003).

Animals observed at Fort Detrick include birds and a number of mammal species that are resistant to habitat alteration. Bird species observed at Fort Detrick include house wren (*Troglodytes aedon*), northern cardinal (*Cardinalis cardinalis*), American crow (*Corvus brachyrhynchos*), gray catbird (*Dumetella carolinensis*), blue jay (*Cyanocitta cristata*), American robin (*Turdus migratorius*), and sparrow species (USAG, 2003). Mammal species that are common to Fort Detrick include white-tailed deer (*Odocoileus virginianus*), eastern cottontail (*Sylvilagus floridanus*), raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), woodchuck (*Marmota monax*), eastern chipmunk (*Tamias striatus*), gray squirrel (*Sciurus carolinensis*), fox squirrel (*Sciurus niger*), and mouse and vole species (USAG, 1998; 2003). No sensitive species are on the EBS subject site (Boyland, 2002). Also, it is not known if karst species exist within the karst features of the EBS subject site.

The stormwater management pond, which was built in 1998/1999, is not a suitable habitat for a wide variety of aquatic species. The only known species in the pond are crayfish (*Cambarus sp.*) and mosquito fish (*Gambusia affinis*), which were stocked to eat mosquito larvae (Boyland, 2002).

The altered environment of Fort Detrick provides little high-quality habitat for most species of wildlife. There are no records for Federal- or State-listed rare, threatened, or endangered species of plants or animals within the boundaries of the Installation (USAG, 2001b). A survey for rare, threatened and endangered small mammals and a survey for rare, threatened, and endangered plants was prepared by the Maryland Natural Heritage Program of the Maryland Department of Natural Resources in February 2002, which found no evidence of special status species on Fort Detrick. Although no special status species were identified, the open areas and fields of the Installation may still provide sufficient habitat for endangered or declining bird species including the Savannah sparrow (*Passerculus sandwichensis*), listed as declining populations in Maryland, and the loggerhead shrike (*Lanius ludovicianus*) and upland sandpiper (*Bartramia longicauda*), listed as endangered in Maryland (Slattery, 1997; USAG, 2001b). The status of species may change over time as a result of changes in listing status for Federal and State threatened and endangered species and as a result of new surveys of the Installation (USAG, 2001b).

3.2.13 Air Quality

Fort Detrick lies within the Central Maryland Air Quality Control Region (Area II). MDE's Air and Radiation Management Administration (ARMA) administers Federal and State air quality regulations statewide. Maryland has adopted the National Ambient Air Quality Standards (NAAQS) for six criteria pollutants: carbon monoxide (CO), lead (Pb), nitrogen oxides (NO_x), ozone (O₃), particulate matter (PM), and sulfur dioxide (SO₂). As of May 2003, the entire State of Maryland was in attainment for all NAAQS criteria pollutants except O₃ (MDE, 2003a).

In general, the air quality of Frederick County, including Fort Detrick, is good except for O₃. An air quality monitoring station at the Frederick County Health Department, approximately 0.5 mile west of Area A, has been monitoring O₃ levels since 1995. The NAAQS peak hourly attainment threshold for O₃ is 125 parts per billion (ppb). During the past seven years, the station reported an exceedance of this threshold level only twice, on 14 September 1998 and on 16 July 1999 (MDE, 2003b).

The main stationary sources of air pollution at Fort Detrick are incinerators, boilers, and diesel generators. Commuter and on-site traffic constitute the mobile sources of air pollution at the Installation (USAG, 2003). The primary sources of hazardous air pollutant (HAP) emissions on the Installation are the boilers and the fuel storage and dispensing activities (Wolf, 2003a). According to the MDE, Fort Detrick is the third largest source of NO_x in Frederick County; with the majority of the Installation's NO_x emissions originating from the central boiler plant and generator facilities (Wolf, 2003a).

Title V of the Clean Air Act (CAA) establishes major-source emissions thresholds for criteria pollutants. Fort Detrick exceeds the threshold levels for NO_x and SO₂, 25 and 100 ppm respectively. Due to these exceedances, the Installation filed a Title V Part 70 permit application for operation of air emission sources (USAG, 2003). The application was submitted to the MDE in July 1997 and was in review as of 01 December 2001. On that date, the USEPA took over the Title V permitting process (MDE, 2002a). Fort Detrick submitted a Title V Part 71 permit application to the USEPA on 30 May 2002. The Title V Part 71 Operating Permit was issued by the USEPA, effective 01 April 2004 (Wolf, 2004).

Title III of the CAA deals with emissions of HAPs not covered under the NAAQS. Under the auspices of the CAA, the State of Maryland has established an emissions standards program regulating toxic air pollutants (TAPs). No outstanding compliance issues for TAPs were identified at Fort Detrick according to a 1992 inventory of emissions from existing sources (U.S. Army Environmental Hygiene Agency [USAEHA], 1992). Since USAG emissions data for Fort Detrick indicate that TAP emissions are not more than 10 tons per year for any single TAP or not more than 25 tons per year in total, the Installation is not required to meet emission control standards for TAPs (USAG, 2003; Wolf, 2003a).

The construction and operation of the proposed NBACC may require a CAA New Source Review (NSR)/Prevention of Significant Deterioration (PSD) evaluation. Fort Detrick is located in a severe O₃ non-attainment area. Because potential NO_x emissions at Fort Detrick surpass 25 tons per year and potential SO₂ emissions surpass 100 tons per year, Fort Detrick is considered a "major source" for permitting purposes under the CAA (Wolf, 2002a). The CAA requires that NSR evaluations be prepared before construction or installation of any new permitted major sources or any major modifications of permitted major sources which have the potential to cause significant increases of criteria pollutants (NO_x, SO₂, CO, Pb, O₃, and PM) and VOCs in non-attainment areas. The CAA requires that PSD evaluations be prepared in attainment areas

before construction or installation of certain types of listed sources which have the potential to emit certain threshold quantities of criteria pollutants.

Air quality permits to construct are currently required for generators greater than 1,000 horsepower (hp) or 746 Kilowatts (kW), but the threshold is expected to change to 500 hp or 373 kW, pending the finalization of a proposed change to COMAR (Wolf, 2003b). Air quality permits-to-operate are required for fuel burning equipment and hot water heaters with maximum rated capacities of 50 MMBtu/hr or more (Wolf, 2002a).

Odor sources emanating from Area A of Fort Detrick originate from the boiler plant, the medical and municipal waste incinerators, the NCI-Frederick, and routine operations conducted at the Installation. Odors from the NCI-Frederick result from autoclaving animal feed. The operation of the Fort Detrick boiler plant creates odorous byproducts. Other odors are produced during routine Installation operations. Petroleum odors occur during the transfer of fuel from the main delivery tank to smaller boiler plant tanks (as many as six times per day). Garbage odors arise during the transport of waste (Greenwood, 2001).

3.2.14 Historical and Cultural Resources

Four structures in Area A are listed on the National Register of Historic Places (NRHP; Maryland Historical Trust, 2002). The One-Million-Liter Test Sphere (Building 527), located approximately 1,580 ft. southwest of the EBS subject site, is listed on the NRHP for its national significance in the scientific development of aerobiology and for its unique structural engineering. Although the One-Million-Liter Test Sphere is located within the boundaries of Fort Detrick, it is owned by NCI-Frederick. The other three NRHP-listed sites are located in the Nallin Farm Complex at the northeast corner of Area A, approximately 2,050 ft. northeast of the EBS subject site. The three NRHP-listed sites in the Nallin Farm Complex are the Nallin Farm House (Building 1652), the Bank Barn (Building 1655), and the Spring House (Building 1661). These structures are listed on the NRHP for their local significance in nineteenth century architecture and agriculture. Additionally, the Nallin Farm Site (18FR684) is an archeological site located between Building 1652 and Building 1654. The Nallin Farm Complex, as a whole, is being considered for designation as a historic district (USACE, 1997).

Buildings 1301 through 1306 are eligible for listing on the NRHP. These buildings were constructed in 1956 to support research and testing by the Crops Research Division (USACE, 2000c). Research was aimed at developing more robust and productive crops, but research was also conducted to evaluate impacts of biological and chemical warfare agents on plants and crops. Building 1301, a large, two-story brick building, and Building 1302, a one-story wing extending from the rear of Building 1301, continue their original function as research laboratories (USACE, 2000c). The USDA currently leases both Buildings 1301 and 1302. Buildings 1303 through 1306 are greenhouses located behind Buildings 1301 and 1302, which are also used by the USDA for its ongoing research program.

Buildings 1412 and 1414 were declared eligible for listing on the NRHP in 2001 (USAMRMC, 2001). Building 1412, constructed in 1958, was a special operations building designed specifically to support biological warfare research during the Cold War era. Building 1414 was an exhaust air incinerator sterilization building associated with Building 1412 (USAMRMC, 2001). Building 1412 is constructed with cinder block walls and relieved by concrete pillars. This building is still used as a laboratory with upgraded modern equipment (USACE, 2000c). Building 1415, a square one-story brick building, was built in 1959 as a guard house, and it is currently used as a Union office (USACE, 2000c). This group of buildings is considered exceptionally

significant as physical examples of the Army's Cold War policies, illustrating that aspect of American Military History (USAMRMC, 2001).

A Phase I Archeological Survey was performed at Fort Detrick from October 1992 through January 1993 (Goodwin and Associates, 1993). A total of five archeological sites were identified in Area A. Three of these archeological sites are located within or adjacent to the EBS subject site: the Stonewall Jackson Beall Site (18FR683) and Historic Sites 18FR681 and 18FR680. The Stonewall Jackson Beall Site (18FR683), encompassing 0.6 acre, is located west of Building 1422 at Ditto Avenue. The Stonewall Jackson Beall House (Building 1401) was determined to no longer have historic value due to the many renovations to the house. However, the Stonewall Jackson Beall Site (18FR683) may retain integrity and archeological research potential. Historic Site 18FR681, encompassing 0.6 acre, is located in the central portion of the EBS subject site. Historic Site 18FR680, encompassing 0.3 acre, is located east of Building 1425 at Porter Street. These two sites (18FR681 and 18FR680) did not warrant further evaluation because they lacked integrity and archeological research potential (Goodwin and Associates, 1993). Therefore, none of these three archeological sites require a protection provision. Also, none of the aforementioned historic structures are included in the lease of property. The Wide Pastures Farm Site (18FR685), located approximately 1,620 ft. west of the EBS subject site, was subjected to further investigation through a Phase II Archeological Survey; however, it was deemed ineligible as a significant archeological site by the Maryland Historical Trust (Goodwin and Associates, 2003).

3.2.15 Energy

The Potomac Edison Power Company (a subsidiary of The Allegheny Power Company) provides electrical power to the Installation via two 35-kilovolt (kV) power lines. The demand for electricity at the Installation is high due to the energy-intensive nature of research activities conducted at Fort Detrick. The total electrical power consumption for the entire Installation in fiscal year 2002 was 139,323,476 kilowatt hours (kWh) (Spears, 2002a).

Peak summer electrical usage at Fort Detrick has the potential to overload the electrical substation located south of Building 1434 (adjacent to the stormwater management pond). This substation will be expanded to accommodate new construction projects on the EBS subject site. The capacity of this substation will be doubled. The current size is estimated to be 10 megavolt amperes, 34.5 kV to 4.15 X 12.47 kV. Another substation (the Old Farm; 230-12.5 kV) was constructed in 2003 on an easement adjoining the USDA complex in the northwestern portion of the EBS subject site (see Figure 2-3).

The Frederick Gas Company furnishes natural gas to Fort Detrick. Natural gas consumption for the entire Installation in fiscal year 2002 was 5,655,120 hundreds of cubic feet (ccf). An annual average of 83 percent of the natural gas provided to the post is used by the boiler plant and the incinerators (Spears, 2002b).

A major energy consumer at Fort Detrick is the central heating plant, which consists of five boilers, a steam sterilization plant, and a steam distribution system. The central heating plant utilizes both natural gas and No. 6 fuel oil to generate steam, which is used for heating and as process steam. The total amount of steam used for the entire Installation in fiscal year 2002 was 559,912,000 pounds (Spears, 2002a).

3.2.16 Noise

Fort Detrick is considered a relatively quiet environment with no significant noise sources on the Installation. Minor sources of noise at Fort Detrick include the boiler plant, the generator facilities in Buildings 1673 and 1677, the carpenter shop in Building 199, vehicular traffic, and the helipad. Occupational noise exposure issues are handled by the Army Industrial Hygiene Department. Industrial hygiene personnel have previously conducted surveys to characterize noise levels at Fort Detrick and have concluded that noise levels on the Installation are not excessive (USAG, 2003). Employees who work in areas with potentially harmful noise levels are enrolled in the Army's Hearing Conservation Program. The bugle and cannon are exercised Monday through Friday at 5:00 p.m. Noise sources near the EBS subject site originate from vehicular traffic on Opossumtown Pike and Frederick Community College.

3.2.17 Transportation

Several roads provide vehicular access to Area A of Fort Detrick. These include Rosemont Avenue to the west, Opossumtown Pike to the east, Military Road to the southwest, and West 7th Street to the south. There are four access gates to Area A. The Main Gate is located at the intersection of West 7th Street and Military Road, on the southeast side of Area A. Alternate gates are located at the intersection of Opossumtown Pike and Porter Street (on the northeast side of Area A) and at the intersection of Rosemont Avenue and Old Farm Road (on the northwest side; USAG, 2003). The EBS subject site is located approximately 800 ft. northeast of the Main Gate. The construction and operations of the southern portion of the NIBC will likely increase traffic volumes on West 7th Street, Opossumtown Pike, and Porter Street. Future growth in the Frederick area will add to the traffic burden in the region. Nine major intersections near the Installation are projected to operate at an unacceptable level of service in 2007 (STV, 2003).

All non-decaled vehicles are required to enter the Installation through the Main Gate. Currently, the Opossumtown Gate, the eastern gate to Area A (at the intersection of Opossumtown Pike and Porter Street), provides access to Fort Detrick personnel in decaled vehicles during restricted hours. The proposed Hotel and Conference Center (HCC) Complex at this location is to include a newly constructed Opossumtown Gate and access road that will serve both the HCC traffic and general Fort Detrick traffic. The proposed access road at the HCC/Opossumtown Gate is to originate at an existing traffic light across from Frederick Community College and adjacent to the Amber Meadows subdivision. Access to the Installation through the newly proposed Opossumtown Gate will continue to be for decaled vehicles only.

3.2.18 Aerial Photographs

Recent and historical aerial photographs (circa 2001 and 1975-1976) were reviewed and found to corroborate the site location and vicinity characteristics described in Section 2.1 and Section 2.2 (Fort Detrick, 2001; see Appendix B and Appendix C). No other historical aerial photographs were available for the EBS subject site.

Aerial photographs of Area A from 1975-1976 were reviewed for the EBS subject site. A "previously disturbed" (i.e., apparently scraped or graded by heavy equipment) rectangle-shaped area of soil was identified west of Building 1650 adjacent to the northeast corner of the EBS subject site (see Appendix J). Presently, this location is occupied by a fenced-in antenna, and Building 1435 is now located immediately south of the area. The previously disturbed area in the photographs was ground-proofed by USAG and BSA Environmental Services, Inc.

personnel on 17 December 2003. Burrows, dug by small mammals (e.g., woodchucks [*Marmota monax*]), were observed throughout the grassy area. Examination of approximately 15 burrows indicated relatively uniform, graded soil. The previously disturbed area in the photographs also appears slightly depressed relative to adjacent areas. It is assumed that the disturbance at this site was from soil scraping. This area is designated as ECP Classification 1 (areas where no release or disposal of hazardous substances or petroleum products has occurred, including no migration of these substances from adjacent areas).

3.2.19 Sanborn Fire Insurance Maps

There is no Sanborn map coverage for Area A of Fort Detrick (Bennett, 2002).

3.2.20 Chain-of-Title Information

The DA acquired the Fort Detrick property in stages between 1943 and 1952. The land constituting Fort Detrick was originally 90 acres in size and was owned by Frederick County (1929), the Maryland National Guard (1932), and the U.S. Army Chemical Warfare Service (1943). The land encompassing the EBS subject site was part of a 502-acre tract that the Army purchased from local residents in 1952 (Covert, 2000). There are currently no liens or encumbrances associated with the EBS subject site (Federline, 2004b).

3.2.21 Fire Department Files

According to Michael Heller, Assistant Chief at the Fort Detrick Fire Department, no fires or other incidents have occurred that may have caused a release of hazardous substances on the EBS subject site or its vicinity for over 30 years (Heller, 2003).

3.2.22 Zoning

Because the EBS subject site is located on a Federal facility, local jurisdictions do not have zoning authority (USAG, 2003).

3.2.23 Maryland Department of the Environment

The MDE is the lead regulatory agency for environmental restoration sites at Fort Detrick. The MDE was involved in the planning and execution of the RI of Area A as discussed in Section 3.1.2. MDE will be contacted upon the approval of any proposed remedial action by the DA. MDE will be involved in the planning and execution of the southern portion of the NIBC to ensure that development does not adversely impact environmentally sensitive receptors or obstruct or negatively affect the remediation of existing pollution.

3.2.24 Maryland Department of Natural Resources

Fort Detrick is required to follow the requirements of the State Forest Conservation Program, which is covered by COMAR 08.19.04. The southern portion of Forest Block 1 lies in the north-central portion of the EBS subject site (see Appendix I). Approximately 1.8 acres of this forest block is to be removed during the construction of the proposed NBACC, which will require the planting of 3.6 acres of forest on another location of the Installation. Additionally, a portion of the forested land that may be encroached upon was in the past monitored by the USDA for a growth regulator project (Boyland, 2004a).

3.2.25 Potential Environmental Concerns in Area A

Several sites in Area A have been identified as areas of potential environmental concern through the Fort Detrick RI, historical records, and geophysical investigations. These areas are the water tower sites (Section 3.1.2); the TCE spill site near Building 568 (Section 3.1.2); the fuel oil spill at Building 190 (Section 3.1.9); the gasoline storage tank leaks near Building 950 (Section 3.1.9); the Area A skeet range; the south-central Area A disposal site; the simulant SM (*Serratia marcescens*) testing area (1953-1955); the clean fill and combustible burn pit sites; the western Area A landfill; a possible medical waste landfill near Building 535; and the laboratory sewer system (LSS) (DA, 1977; USAG, 1997; USACE, 2000b; NCI, 2003; USAG, 2003). Four of these areas were described in Section 3.1 and Section 3.9 as noted.

Four of these sites are located within the EBS subject site: (1) the Area A skeet range; (2) the south-central Area A disposal site; (3) the simulant SM testing area (1953-1955); and (4) the LSS. Information regarding these four sites is presented below.

Area A Skeet Range

A possible recreational skeet range in the southeast corner of Area A was identified in November 2002 (see Appendix D and Appendix J). The range was in operation from approximately the 1950s through the 1980s. The former skeet range was located at Building 1520 and extended out approximately 1,000 ft., in an arc southeast to north-northwest (towards Building 1434, the Barquist Army Health Clinic). Approximately 1 acre of the 26.7-acre skeet range lies within the EBS subject site, adjacent to the Barquist Army Health Clinic. Because lead contamination from firearm discharge in this area was a potential concern, a soil remedial investigation was performed on this site in July 2003. Laboratory analytical results showed lead concentrations to be from 31 to 104 milligrams per kilogram (mg/kg), which are slightly above background levels for that area (i.e., 12 to 28 mg/kg). However, the levels were not higher than MDE residential and industrial risk-based concentration (RBC) levels of 400 mg/kg and 1,000 mg/kg, respectively. Therefore, no remediation of the area was deemed necessary. These slightly elevated lead levels may be attributed to the operation of the former skeet range in this area (Gortva, 2003b). This area is designated as ECP Classification 3 (areas where release, disposal, and/or migration of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action).

South-Central Area A Disposal Site

A 2001 airborne geophysical survey of Fort Detrick revealed magnetic anomalies approximately 400 ft. northwest of Building 1434 (Barquist Army Health Clinic), and a visual reconnaissance in October 2002 uncovered a previously unknown disposal site at that location (see Appendix D and Appendix J) (USAG, 2002b). Because power lines on the site obscured the airborne geophysical survey in this area, the presence of magnetic anomalies, suggestive of buried materials at this site, could not be precluded. In March 2003, an electromagnetic sweep of the property with a portable device concluded that no large buried electromagnetic anomalies were present (Shaw Environmental and Infrastructure, Inc., 2003). The 2001 airborne geophysical survey map was cross-referenced with an existing Installation base map depicting both aboveground structures and buried utilities. Based upon the utility line information from this base map, the line of pink/red-colored anomalies, which runs west-to-east through the central portion of the EBS subject site, was assumed to be the delineation of a 12-inch cast iron water line (Williams, 2003).

A trenching investigation was completed in April 2003 for the disposal site, which is located within the EBS subject site on the site of the proposed NBACC. This investigation included the excavation of twelve 50-foot long, 4-foot deep trenches. Objects recovered in this study included metal pipes, rebar, and large quantities of limestone fill. Elevated levels of arsenic and iron were detected; however, these values were within the background levels of the area (Shaw Environmental and Infrastructure, Inc., 2003). These investigations provide no evidence of buried hazardous materials on the south-central disposal site. This area is designated as ECP Classification 1 (areas where no release or disposal of hazardous substances or petroleum products has occurred, including no migration of these substances from adjacent areas).

Simulant SM Testing Area (1953-1955)

During the time period of 1953-1955, DA records indicate that outdoor testing of a biological simulant (*Serratia marcescens*) was conducted on the southern portion of the NIBC (see Appendix D and Appendix J). The DA records show the testing area to be approximately 5.7 acres in size, spanning a portion of the NIAID site, the proposed NBACC site, and Building 1434 (DA, 1977). *S. marcescens* is a common microbe which lives in soil, water, on plants, and in animals. It is a member of the family Enterobacteriaceae and a human pathogen responsible for a large percentage of nosocomial infections (nosocomial infections are those that originate or occur in a hospital or hospital-like setting). In humans *S. marcescens* can cause meningitis, endocarditis, and pyelonephritis. In the last three decades there has been a steady increase in nosocomial *S. marcescens* infections, especially in neonates and immuno-compromised patients. Cultures of *S. marcescens* have been isolated from soil. From a health and safety standpoint, *S. marcescens* is of concern due to its virulence and increasing resistance to antibiotics, as well as to the increasing number of cases. Human infections attributed to *S. marcescens* unrelated to hospital settings are uncommon (Johns Hopkins Medical Institutions, 1997). Ample evidence indicates that it is highly unlikely that populations of *S. marcescens* would survive 50 years after stimulant testing ceased (Ko et al., 2000; Weiss et al., 1975; Cox et al., 1974; Riley and Kaufman, 1972). This area is designated as ECP Classification 3 (areas where release, disposal, and/or migration of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action).

Laboratory Sewer System

The LSS, which was constructed in stages between 1949 and 1972, was used for conveyance of biological wastes produced by former Army biological warfare (BW) laboratories at the Installation until the cessation of offensive BW research in 1969. Potentially infectious wastewater was decontaminated or sterilized in the laboratories before discharge into the LSS, which conveyed the waste to the steam sterilization plant (SSP) for sterilization. Effluent from the SSP was discharged to sanitary sewers for further treatment at the Fort Detrick WWTP and eventual discharge to the Monocacy River (USAMRMC, 2002).

Currently, the LSS is used to transport wastewater generated by USAMRIID and the USDA Building 374 greenhouse complex (USAG, 1997). USAMRIID wastewater requires additional sterilization because the facility contains Biosafety Level-4 laboratories, which house dangerous and highly infectious etiologic agents. The USDA greenhouse complex is connected to the LSS-SSP system because research at this facility involves exotic and potentially invasive species.

Within the EBS subject site, USAMRIID research facilities (Buildings 1412 and 1425) currently utilize the LSS and sanitary sewer service (see Appendix J) (USAG, 1997). USAMRIID generates an annual quantity of approximately 24,802,000 gallons of potentially infectious

wastewater that must be sterilized twice prior to discharge into the sanitary sewer system (USAMRMC, 2001). Initially, all Biosafety Level-4 wastewater from USAMRIID is decontaminated at the laboratory; then the effluents are sterilized a second time at the SSP. Wastewater from the proposed USAMRIID Animal Facility, Building 1408, will also require steam sterilization and will be connected to the LSS-SSP upon completion (USAMRMC, 2002).

The LSS consists of underground piping ranging from a 6-inch diameter to an 8-inch diameter pipe within the EBS subject site. Pipe is primarily cast iron with leaded bell and spigot joints with the exception of building connections accomplished after 1992. These building connections are constructed using ductile iron pipe with mechanical (stuffing box) type joints. The LSS lines to the SSP are all gravity flow. Practice has been that LSS lines are encased in a minimum of 6 inches of un-reinforced concrete on all sides of the pipe. In addition reinforced concrete has been specified in some unstable locations. Concrete encasement serves as physical protection and line identification (USAG, 1997a). The LSS is generally 10 ft. or less below the ground surface, generally above the water table, and overlying a formation of karst bedrock (RASCO Inc., 1996).

Fort Detrick will be replacing the LSS-SSP system. The impacts of abandoning the LSS and constructing new local sterilization facilities to support other Fort Detrick tenants, including the potential presence of underground contamination in Area A from past research activities, were evaluated and found not to be significant (USAG, 1997). However, interim measures (i.e., upgrading portions of the existing LSS) have been initiated to replace segments previously identified as having the highest potential for leakage. The new LSS being installed is a double-wall pipe with built-in leak detection. The SSP remains in use. In addition, some portions of the LSS will continue in service until a new system is constructed. Upon completion of planned upgrading of the systems for treatment of biological wastes on the Installation, the LSS will be abandoned after decontamination, and the SSP will be deactivated (USAG, 2003). The portion of LSS on the EBS subject site is designated ECP Classification 1 (areas where no release or disposal of hazardous substances or petroleum products has occurred, including no migration of these substances from adjacent areas). There have been no known releases of biological materials from the LSS on the EBS subject site.

3.2.26 Security

Fort Detrick is a limited-access Installation. Access to the Installation is currently gained through three guarded gates (see Section 3.2.17). Random vehicle searches are conducted at security checkpoints.

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4.0 INFORMATION DERIVED FROM SITE RECONNAISSANCE AND INTERVIEWS WITH PERSONNEL

4.1 ON-SITE OBSERVATIONS

The following visual observations were made during the site reconnaissance conducted on 17 December 2003 and 07 January 2004:

1. The southern portion of the NIBC is currently used for administrative and laboratory facilities and undeveloped grasslands (see Figure 2-4).
2. A total of 26 buildings are currently located on the EBS subject site. None of these buildings appeared to be in a state of disrepair. No loose or chipping paint was observed on the exterior surfaces of these structures.
3. Vehicular traffic in the areas surrounding the EBS subject site was moderate. The construction and operations of the southern portion of the NIBC would likely increase vehicle traffic volumes considerably on West 7th Street, Opossumtown Pike, and Porter Street, which runs east-to-west between them.
4. An electrical power transmission line traverses the EBS subject site in a general northwest-to-southeast direction. An Allegheny Power electrical substation was constructed in 2003 on an easement east of the USDA complex.
5. A total of seven pole-mounted transformers were observed on the EBS subject site. Four of these transformers are located on the USDA complex. These transformers must be treated as a possible source of PCBs.
6. A visual inspection confirmed evidence of buried construction debris in the central portion of the EBS subject site, known as the South-Central Area A Disposal Site, near the proposed location of the NBACC. No evidence of buried hazardous materials was identified during the site reconnaissance or interviews with Installation personnel.

4.2 POTENTIAL PRESENCE OF HAZARDOUS MATERIALS

The preparers of this EBS conducted visual inspections, interviewed site personnel, and consulted pertinent files and reports to assess the potential presence of hazardous materials on the EBS subject site and to identify existing, planned, or potentially required remedial actions.

4.2.1 Asbestos

Asbestos is a naturally occurring fibrous silicate crystal. Inhalation of airborne fibers of asbestos can cause lung disease and cancer. Contractors have access to an installation-wide asbestos survey through the Construction Services Office located in Building 201. The survey results provide contractors with information that assists them, on a case-by-case basis, with instituting the necessary safety and operational procedures to safeguard workers and the environment from the potentially harmful effects of asbestos (USAG, 1998). Table 4-1 summarizes the results of the asbestos-containing material (ACM) surveys conducted in the 1990s for the buildings of the EBS subject site. Prior to the demolition of any buildings on the EBS subject site, contractors should determine the potential for construction worker exposure to ACMs

during demolition and/or construction. There are no known releases of ACMs to the soils on the EBS subject site.

4.2.2 Lead

The MDE estimates that 95 percent of housing units in Maryland built before 1950 contain lead-based paint (MDE, 2002b). Many of the buildings on the EBS subject site were constructed before 1978 when lead-based paint was banned for residential use. Lead-based paint surveys conducted in the early 1990s found elevated lead levels in paints in and on Building 1301, Building 1302, Building 1303, Building 1304, Building 1412, Building 1414, and Building 1425 (USAG, 1998; see Table 4-1).

Three water towers are located in Area A: the west water tower, the south water tower, and the north water tower. The north water tower is located within the western portion of the EBS subject site (see Appendix D). An RI detected lead concentrations above maximum background levels and USEPA residential and industrial screening levels throughout the soil surrounding each of the water towers. The elevated levels of lead were attributed to the weathering and sandblasting of lead-based paint covering the water towers. In addition, a few isolated samples also showed elevated thallium and iron concentrations (USACE, 2000a). However, an HHRA for the water towers site concluded that non-residential use of the three sub-sites does not pose an elevated risk of adverse effects on human health and recommended no further remedial action for this site (USACE, 2000b).

A possible recreational skeet range in the southeast corner of Area A was identified in November 2002. The range was in operation from approximately the 1950s through the 1980s. The former skeet range was located at Building 1520 and extended like a fan out approximately 1,000 ft. southeast of Building 1520, north to Building 1434 (Barquist Army Health Clinic). Because lead contamination from firearm discharge in this area was a potential concern, a soil RI was performed on this site in July 2003. Laboratory analytical results showed lead concentrations to be from 31 to 104 mg/kg, which are slightly above background levels for that area (i.e., 12 to 28 mg/kg). However, the levels were not higher than MDE residential and industrial RBC levels of 400 mg/kg and 1,000 mg/kg, respectively. Therefore, no remediation of the area was deemed necessary. These slightly elevated lead levels may be attributed to the operation of the former skeet range in this area (Gortva, 2003b).

4.2.3 PCBs

PCBs were commonly used in power transformers and ballasts for fluorescent lighting before 1978. There were no documented PCB spill incidents at the Installation (Gortva, 2002b). The pad-mounted transformers at Fort Detrick are newer and do not contain PCBs (Adkins, 2002a). However, there are several small, pole-mounted transformers on Area A that must be treated as possible sources of PCBs. The Fort Detrick Pollution Prevention Plan designates "PCB transformers" as having concentrations of PCBs equal to or greater than 500 ppm and "PCB-contaminated" as having concentrations of PCBs within 50-499 ppm (USAG, 2001a). Transformers having concentrations less than 50 ppm are not regulated by the Toxic Substances Control Act (TSCA) (USAG, 2001a). As discussed in Section 4.1, a total of seven pole-mounted transformers are located on the EBS subject site (see Figure 5-1) (Gortva, 2004b). It is not known if these transformers contain PCBs. The pole-mounted transformers on the EBS subject site did not appear to be leaking (Gortva, 2004c). These transformers are treated as "PCB transformers" until they malfunction or leak, at which time the transformers are then tested and removed (Schmidt, 2004). Contractors must comply with 40 CFR 761, which

**Table 4-1. Lead-Based Paint and Asbestos-Containing Material on Interior/Exterior Surfaces
of Existing Buildings on the Southern Portion of the NIBC.**

Building Number	Year Built	LBP Survey Dates	Lead-Based Paint Known or Suspected Presence [†]	ACM Survey Dates*	ACM Presence or Absence [‡]
1300	2001	N/A	No Known or Suspected Presence	N/A	Unknown
1301	1956	1990-1993	Known Presence	1997	Known Presence
1302	1956	1990	Known Presence	1997	Known Presence
1303	1956	1990	Known Presence	1997	Known Presence
1304	1956	1990	Known Presence	1997	Known Presence
1305	1956	N/A	Suspected Presence	1997	Known Presence
1306	1956	N/A	Suspected Presence	1997	Known Presence
1307	1974	N/A	Suspected Presence	1997	Known Presence
1308	1977	N/A	Suspected Presence	1997	Known Presence
1309	1982	N/A	No Known or Suspected Presence	1997	Known Presence
1312	1957	N/A	Suspected Presence	N/A	Unknown
1313	1973	N/A	Suspected Presence	1997	No ACMs Present
1315	1965	N/A	Suspected Presence	1997	Known Presence
1316	1957	N/A	Suspected Presence	1997	Known Presence

Source: DA, 1992; DA, 1994; USAG, 1998; Sheffer, 2004.

Note: N/A indicates that no lead-based paint or ACM survey was conducted for this building.

* The initial ACM survey for these buildings was conducted in the early 1990s. An update of this ACM survey was completed in November 1997.

[†] “Known lead-based paint” means that the survey result(s) for the building surface(s) tested (interior and/or exterior) was/were equal to or greater than 0.06% total lead by weight using Atomic Absorption Spectroscopic analysis. If no lead-based paint survey was conducted for a particular building, then the construction date of the building was used to determine the “suspected presence” of lead-based paint on interior and/or exterior surfaces of the building. Buildings that were not surveyed are considered to have “suspected” lead-based paint if they were constructed before January 1978.

[‡] “Known asbestos-containing material” means that the survey results from 20 November 1997 indicate the presence of asbestos in various forms (including wrap, putty, caulk, seam sealer, troweled-on, flexible joint, packing, mastic, cement board, linoleum, tile, etc.) in one or more areas of the building. “Unknown” means that this building was not included in the ACM surveys.

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Table 4-1. Lead-Based Paint and Asbestos-Containing Material on Interior/Exterior Surfaces of Existing Buildings on the Southern Portion of the NIBC.

Building Number	Year Built	LBP Survey Dates	Lead-Based Paint Known or Suspected Presence[†]	ACM Survey Dates*	ACM Known or Suspected Presence[‡]
1408	2003	N/A	No Known or Suspected Presence	N/A	Unknown
1412	1958	1992-1993	Known Presence	1997	Known Presence
1414	1958	1992	Known Presence	1997	Known Presence
1415	1959	N/A	Suspected Presence	1997	Known Presence
1420	1997	N/A	No Known or Suspected Presence	N/A	Unknown
1422	1963	N/A	Suspected Presence	1997	Known Presence
1423	1987	1993	No Known or Suspected Presence	1997	Known Presence
1425	1969	1991-1994	Known Presence	1997	Known Presence
1432	1994	N/A	No Known or Suspected Presence	N/A	Unknown
1433	2002	N/A	No Known or Suspected Presence	N/A	Unknown
1436	1998	N/A	No Known or Suspected Presence	N/A	Unknown
1438	2002	N/A	No Known or Suspected Presence	N/A	Unknown

Source: DA, 1992; DA, 1994; USAG, 1998; Sheffer, 2004.

Note: N/A indicates that no lead-based paint or ACM survey was conducted for this building.

* The initial ACM survey for these buildings was conducted in the early 1990s. An update of this ACM survey was completed in November 1997.

[†] “Known lead-based paint” means that the survey result(s) for the building surface(s) tested (interior and/or exterior) was/were equal to or greater than 0.06% total lead by weight using Atomic Absorption Spectroscopic analysis. If no lead-based paint survey was conducted for a particular building, then the construction date of the building was used to determine the “suspected presence” of lead-based paint on interior and/or exterior surfaces of the building. Buildings that were not surveyed are considered to have “suspected” lead-based paint if they were constructed before January 1978.

[‡] “Known asbestos-containing material” means that the survey results from 20 November 1997 indicate the presence of asbestos in various forms (including wrap, putty, caulk, seam sealer, troweled-on, flexible joint, packing, mastic, cement board, linoleum, tile, etc.) in one or more areas of the building. “Unknown” means that this building was not included in the ACM surveys.

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regulates the handling, removal, and disposal of PCBs. The locations of these transformers are designed as ECP Classification 1 (areas where no release or disposal of hazardous substances or petroleum products has occurred, including no migration of these substances from adjacent areas).

4.2.4 Pesticides

Building 122, located in the southwest corner of Area A, was used for the storage and mixing of pesticides. The Area A RI concluded that activities at that building have not resulted in soil and/or groundwater contamination (USACE, 2000a). Pesticide applications at Fort Detrick are carried out by trained and certified personnel, in accordance with applicable Federal, State, and local regulations (USAG, 2003). All pesticides that are routinely used at Fort Detrick have been applied in accordance with the manufacturer's label, and no unauthorized release or disposal has been identified or recorded. A "weed and feed" pesticide has been applied on the grasses around Building 1412 and Building 1425 on the EBS subject site (Boyland, 2004b). A pesticide mixing area is located within a USDA greenhouse laboratory at Building 1301 (Boyland, 2004c).

4.2.5 Radon

The USEPA recommends mitigation to reduce indoor radon concentrations for houses that exceed the 4 picoCuries per liter of air (pCi/L) action level (USEPA, 2002d). Radon data were obtained for Building 1412 and Building 1425. Fifty-two tests were conducted from 1989 through 1992. Radon concentrations exceeded the USEPA recommended level in only three cases. All three of these readings were taken in an unfinished basement under Ward 200 in the main laboratory complex of USAMRIID (Adkins, 2002b). Building 1412 and Building 1425 are unlikely to be part of any real estate action related to the NIBC.

4.2.6 Hazardous Materials

Hazardous Material Management

The Superfund Amendments and Reauthorization Act (SARA) establishes the reporting requirements for the storage and release of hazardous materials (i.e., threshold planning quantities [TPQs] and reportable quantities for hazardous materials releases). Five chemicals are stored in USEPA reportable quantities on the Installation: aluminum sulfate, nitrogen, sulfuric acid, sulfur dioxide, and chlorine. The "maximum daily amount" is the maximum amount of a compound that is present at a particular location on any given day. Aluminum sulfate is stored at the WTP (Area C, Building 1132) on Area C of the Installation. The maximum daily amount for aluminum sulfate is less than 10,000 lbs. Nitrogen is stored at the Steam Sterilization Plant (Building 375) and USAMRIID (Building 1425). The maximum daily amount for nitrogen is less than 100,000,000 lbs. Sulfuric acid is stored at the Boiler Plant (Building 190), which is located approximately 2,850 ft. southwest of the EBS subject site. The maximum daily amount for sulfuric acid is less than 10,000 lbs. Sulfur dioxide is stored at the WWTP (Area C, Building 1110) on Area C. The maximum daily amount for sulfur dioxide on the Installation is less than 1,000 lbs. Chlorine gas is stored at the WTP (Area C, Building 1123) and the WWTP (Area C, Building 1110) on Area C. The maximum daily amount for chlorine gas is less than 10,000 lbs (USAG, 2003).

Other hazardous chemicals in non-reportable quantities are warehoused in Building 262 prior to distribution (Leadore, 2002). Building 1425 stores approximately 80 lbs of corrosives, 30 lbs of toxics and poisons, and 240 lbs of flammables per month (USAG, 2002c).

Hazardous Waste Management

In accordance with FD PAM 200-3b, *Hazardous Waste Management Plan and Procedures*, all hazardous waste that is generated on the Installation is collected by the generating tenant in Satellite Accumulation Points (SAPs). A SAP is a hazardous waste collection area where a generator may accumulate up to 55 gallons of hazardous waste or 1 quart of acutely hazardous waste (i.e., P-listed). SAPs are located at the point of generation and are under the control of the facility operator. All containers in a SAP must be clearly marked as “Hazardous Waste” or with the contents of the container and the accumulation date. The accumulation date is the date that the waste leaves the SAP, which simultaneously starts the 90-day time period that hazardous waste may be stored in a temporary storage area. Additional requirements for the operation of SAPs are provided in FD PAM 200-3b. Hazardous waste containers are transported by HMMO from a SAP to an approved temporary storage area within 72 hours of reaching the 55-gallon hazardous waste limit or the 1-quart acutely hazardous waste limit (USAG, 2003).

Hazardous waste and spent hazardous materials (SHMs) must be collected at designated SAPs on the Installation. The USAMRIID (Building 1412 and Building 1425) and USDA (Building 1301) waste sorting centers are both located on the EBS subject site. Disposal of hazardous waste and SHM must be performed in accordance with applicable Federal, State, local, and DA regulations (USAG, 2003).

A temporary storage area is a location where hazardous waste is stored for up to 90 days after it leaves a SAP. Requirements for temporary storage areas include secondary containment, chemical resistant and seamless floors, emergency equipment (e.g., phone, personal protective equipment [PPE], shower, fire extinguisher), and appropriate warnings and signs indicating the potential hazards associated with the facility. Once wastes are received at a temporary storage area, they are separated according to their USEPA hazard classification (i.e., ignitable, corrosive, toxic, and/or reactive). Additional specifications for temporary storage areas are listed in FD PAM 200-3b (USAG, 2003).

4.2.7 Radioactive Materials

Building 261, located in the southwest corner of Area A, was the 90-day accumulation point for low-level radioactive waste pending off-site disposal (USAG, Environmental Management Division, 2001). This facility is currently being decommissioned through the Nuclear Regulatory Commission (Gortva, 2002b).

Currently, radiological waste is sorted and disposed of by the Fort Detrick tenants separately. The NCI, USAMRIID (Building 1412 and Building 1425), USDA (Building 1301), and Building 262 are sorting centers (Leadore, 2003). The USAMRIID (Building 1412 and Building 1425) and USDA (Building 1301) waste sorting centers are both located on the EBS subject site. No known releases of radioactive materials have occurred on or have migrated to the EBS subject site.

4.3 UTILITY CAPACITY

The southern portion of the NIBC was not included explicitly in the projects evaluated in the *Environmental Assessment, Installation Master Plan for Fort Detrick, Maryland* (USAG, 2003). At that time, a “Biomedical Research Campus” was presented as a proposed project that would be comprised of several high-level biological containment laboratories, including the existing USAMRIID laboratories, the planned NIAID IRF, and similar facilities for DHS and other tenants.

Potential cumulative impacts of NBACC and later additions to the NIBC will include increased demands for utilities and increased quantities of waste for disposal. The utilization of on-site utilities, including water supply, steam, wastewater treatment and disposal, and the incinerator plant, are discussed below.

4.3.1 Projected Utility Consumption and Waste Generation by NBACC

Table 4-2 summarizes the projected annual total utility consumption, wastewater discharges, refuse, and solid waste that will result from operation of the NBACC. The projections followed the methodology used to estimate utility consumption and waste generation resulting from operation of the NIAID IRF in the *Installation Master Plan EA* (USAG, 2003) and the *Final Environmental Impact Statement, Construction and Operation of an Integrated Research Facility by the National Institutes of Health at Fort Detrick, Maryland* (NIH and USAG, 2003).

The projections for NBACC are based on actual quantities for the existing USAMRIID facilities (Potter, 2004a), scaled in proportion to the total floor space (270,000 gsf for NBACC and 339,000 gsf for USAMRIID). The USAMRIID water consumption quantity represented an average of data for the 4-year period Fiscal Year (FY) 2000 through FY 2003 (Potter, 2004b). The other utility and waste quantities for USAMRIID used Fiscal Year (FY) 2002 data, as compiled in the *Installation Master Plan EA* (USAG, 2003).

Table 4-2. Utility Use Projections for the NBACC.

UTILITY OR WASTE	UNITS	ANNUAL TOTALS		PROJECTED INSTALLATION INCREASE
		FUTURE BASELINE	PROJECTED NBACC Ph I & Ph II	
Utility Consumption				
Electricity	gigawatt hours	153.8	12.3	8.0%
Water	million gallons	556.2	36.9	6.6%
Natural Gas	million ccf	6.58	1.35	20.5%
Steam	million pounds	632.3	119.2	18.9%
Wastewater Discharges				
Total to sanitary sewer	million gallons	331.7	24.2	7.3%
Potentially Contaminated	million gallons	12.83	0.00	N/A
Refuse/Solid Waste Generated				
Solid (Non-hazardous)	tons	4,659.3	132.5	2.8%
Medical	tons	845.7	55.8	6.6%
Hazardous (RCRA)	tons	12.18	1.04	8.6%
Radiological	Liters	572.0	304.2	N/A

Future Baseline: Existing Installation Total + Approved Projects + RCI + NIAID IRF

Water projections include increased water consumption by incinerators and boilers.

The data in Table 4-2 indicate that operation of NBACC will result in small incremental increases of utility consumption and waste generation with respect to their respective baseline values. The projected increases range from 2.8 percent for solid (non-hazardous) waste generated to 20.5 percent for natural gas consumption. The baseline values represent existing utility consumption or waste generation, plus the incremental increases due to operation of the projects under construction as of the Installation Master Plan EA (USAG, 2003), the NIAID IRF, and the Residential Community Initiative (RCI). The baseline for water consumption also includes indirect increases due to the increased requirements for steam resulting from operation of these projects and the increased operation of the incinerator plant required for disposal of municipal solid waste and medical waste generated by these projects.

4.3.2 Projected Ultimate Utility Capacity Utilization by the Southern Portion of the NIBC

Table 4-3 summarizes the projected annual total utility consumption (assumes 1.5 million gsf) upon completion of NBACC, as calculated from the data in Table 4-2. Table 4-3 also presents projections of annual total utility consumption upon completion of later additions to the NIBC and the projected ultimate capacity utilization for the on-site utilities. It is assumed that the existing steam sterilization plant continues to treat existing USAMRIID discharges of potentially contaminated wastewater, but the NIAID IRF, NBACC, and later additions will not add to that loading. It is also assumed that all municipal solid waste and medical waste undergo incineration on-site in the existing incinerators.

These projections are based on a total of 1,500,000 gsf of floor space in the ultimate NIBC and follow the methodology described above for the NBACC increments. The projections for water consumption also include indirect increases, as described above, resulting from NBACC and later additions to the NIBC.

Capacity utilization is based on the respective on-site Installation utility capacity, calculated on the basis of hourly or daily capacity and full-time year-round operation, subject to limitations required under existing environmental permits. Water supply capacity is limited by the Installation's permit for withdrawal of water from the Monocacy River up to an average of 2.0 million gallons per day (mgd) (Withdrawals up to 2.5 mgd are allowed, but the 2.0 mgd average cannot be exceeded on a monthly or annual basis). Similarly, treated wastewater discharges are limited to an average of 2.0 mgd under conditions of the Installation's NPDES Permit.

The two existing municipal solid waste incinerators are both limited to 16 hours per day operation, 260 days per year under the Installation's refuse disposal permit. The existing medical waste incinerators can operate 24 hours per day but are also limited to 260 days per year. The steam capacity is based on all boilers operating 24 hours per day, 365 days per year. Similarly, the steam sterilization plant capacity is based on all sterilization tanks operating 24 hours per day, 365 days per year.

Table 4-3 indicates that water consumption by Fort Detrick is projected to utilize 95% of the Installation's capacity upon completion of the ultimate NIBC. It would be difficult to sustain such a high degree of utilization in view of seasonally high water demands during the summer and potential additional limitations on water withdrawal during future drought conditions.

However, the other on-site utilities will have much lower capacity utilization upon completion of the ultimate NIBC. The highest of these, the municipal solid waste incinerators (62%) and the Fort Detrick wastewater treatment plant (58%), will have sufficient capacity available to meet seasonal or incidental high demands.

Table 4-3. Utility Use Projections for the NIBC.

UTILITY	UNITS	FORT DETRICK INSTALLATION ANNUAL TOTALS		ON-SITE INSTALLATION UTILITY CAPACITY	PROJECTED ULTIMATE CAPACITY UTILIZATION	BASIS OF ON-SITE INSTALLATION UTILITY CAPACITY
		FUTURE BASELINE + NBACC Ph I and Ph II	ULTIMATE BIODEFENSE CAMPUS			
Electricity	gigawatt hours	166.1	200.0	N/A	N/A	
Water *	million gallons	593.1	694.4	730	95%	Water withdrawal permit limit: 2.0 mgd average, 365 days/year
Natural Gas	million ccf	7.93	11.63	N/A	N/A	
Steam	million pounds	751.6	1,078.8	3,443	31%	All boilers operating: 393,000 lb/hr, 24 hr/day, 365 days/year
Wastewater Treatment	million gallons	355.8	422.2	730	58%	NPDES permit limit: 2.0 mgd average, 365 days/year
Steam Sterilization Plant	million gallons	12.83	12.83	420	3%	1.152 mgd, 365 days/year
Municipal Solid Waste Incinerator	tons	4,791.8	5,155.4	8,320	62%	2 incinerators @ 2000 lb/hr, 16 hours/day, 260 days/year
Medical Waste Incinerator	tons	901.5	1,054.5	6,240	17%	2 incinerators @ 1000 lb/hr, 24 hours/day, 260 days/year

FUTURE BASELINE: Existing Installation Total + Approved Projects + RCI + NIAID IRF

* Note: projections include increased water use by incinerators and boilers

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4.3.3 Water Use Projections

Scenario Analysis of Water Use Increments

In view of the projected 95% utilization of water supply capacity upon completion of the ultimate NIBC, a specific scenario for incremental water supply requirements for NBACC and later additions to the NIBC was developed. This scenario assumes that USAMRIID will increase its floor space to a net total of 1,000,000 gsf upon completion of the ultimate NIBC. The total floor space for the ultimate NIBC will be 1,500,000 gsf, as in Section 4.3.2 and Table 4-3. Table 4-4 summarizes the floor space increments for each stage of the scenario analysis.

Table 4-4. Assumed Floor Space for Water Use Scenario Analysis.

Biodefense Campus Increment	Existing USAMRIID	NIAID IRF	NBACC Phase I	NBACC Phase II		Ultimate NIBC
Added Floor Space, gsf		150,000	160,000	110,000		741,000
Total NIBC Floor Space, gsf	339,000	489,000	649,000	759,000		1,500,000

Table 4-5 summarizes the calculated water consumption and water supply capacity utilization at each of these stages of NIBC development. Water use directly attributable to the NIBC facilities is separated from water use by the rest of the Installation. This allows a separate accounting for the indirect additional water requirements at each increment due to increased loading of the incinerators and steam boilers resulting from the new facilities. The existing water use is based on the FY02 Installation Total, plus projected use by the Military Construction Army (MCA), Unaccompanied Enlisted Personnel Housing (UEPH) II, Animal Facility, AFMESA, Commissary, and Post Exchange (PX), and the increment for the NIAID IRF includes projected water use for the RCI project, using projections calculated for the Installation Master Plan EA (USAG, 2003).

Table 4-5 indicates that utilization of the Fort Detrick water supply capacity will increase from the current 70% to 76% upon completion of the NIAID IRF, 79% after addition of NBACC Phase I, and 81% after the addition of NBACC Phase II. The impact of potential limited available water supply capacity would not become significant until the later additions approach the ultimate NIBC.

Water Use Metrics for Facilities with High-Level Biological Containment Laboratories

The preceding projections and scenario analysis of water use in NBACC and other NIBC facilities were all based on the average of USAMRIID water consumption during FY 2000 through 2003 (Potter, 2004b) and scaled in proportion to total floor space. This metric (12.8 million gallons/year per 100,000 gsf) is seen to be similar to values for other Research, Development, Testing, and Evaluation facilities with high-level biological containment laboratories, as shown in Table 4-6.

The metrics for two NIH facilities are somewhat lower than the existing USAMRIID facilities value. However, both the existing NCI-Frederick and the proposed IRF at the NIH Rocky Mountain Laboratory facilities include a much higher proportion of administrative space in their total gsf than that of USAMRIID.

Comparison to an Optimistic Scenario

The lowest value in Table 4-6 (8.2 million gallons/year per 100,000 gsf) provides a basis for calculation of an optimistic scenario. Table 4-7 summarizes the results of that scenario.

Assuming that all new facilities for the NIBC will achieve that value and that any existing USAMRIID facilities retained for the ultimate NIBC will be refurbished to that level, direct water consumption in the NIBC would be 123 million gallons/year. This represents considerable savings with respect to the projected 192 million gallons/year under the previous scenario. However, the total water consumption for Fort Detrick under the optimistic scenario would be at 86 percent of capacity. Therefore, even under the optimistic scenario, the impact of limited available water supply may be significant upon completion of the ultimate NIBC.

4.4 ELECTROMAGNETIC FIELDS (EMF)

The northern portions of the EBS subject site near the new Allegheny Power substation, the southern portions of the EBS subject site near the substation on Porter Street (which is scheduled for expansion), and eastern portions of the EBS subject site associated with the 230-kV transmission lines may be affected by electrical and magnetic fields.

Potential human health impacts due to exposure to magnetic fields resulting from the operation of the AP substation and associated structures were addressed in the *Environmental Assessment (EA) for the Construction and Operation of an Electrical Substation by AP at Fort Detrick, Maryland* (USAG, 2002d). The EA cited an authoritative report issued in 1999 under the auspices of the National Institute of Environmental Health Sciences (NIEHS) which noted that evidence from epidemiological studies suggests “small increased risk with increasing exposure” associated with two forms of cancer, childhood leukemia and chronic lymphocytic leukemia in occupationally exposed adults. However, the NIEHS report indicated that results of laboratory (animal and human) toxicology and mechanistic studies fail to indicate a cause-and-effect relationship between exposure to EMF at environmental levels and disease.

Various electronic equipment as well as magnetic data carriers may be affected by magnetic fields including cathode ray devices, electronic implants such as cardiac pacemakers, computers, magnetic storage media, credit cards, and analog watches may be affected (CERN, 1993). USDA reports that some laboratory equipment apparently has been affected since the AP substation became operational (Emerson, 2004).

Calculated magnetic field levels in the vicinity of the substation and adjoining portions of the 230-kV lines for current and future peak summer loading conditions were presented in the EA. The calculations by AP used a computer model that has been tested and verified by power engineers. The calculations indicated that the highest magnetic fields outside the substation will occur along the southeastern fence and under the 230-kV lines. The highest current magnetic field levels, 10 to 12 milliGauss (mG), occur directly under the 230-kV lines, decaying to less than 1 mG within 200 to 250 ft. away from the lines. These values are within the range of typical indoor home magnetic fields. Operation of the substation will increase the magnetic fields several fold. In the worst case, the maximum magnetic fields (estimated at 33 mG) will be along the 230-kV lines 100 to 200 ft. to the southeast of the substation, decaying to less than 1 mG within approximately 350 ft. away from the lines. No data are available describing magnetic fields at the substation on Porter Street or along the remainder of the 230-kV transmission lines.

Table 4-5. Water Use Scenario Analysis for the NIBC (Based on USAMRIID).

Biodefense Campus Increment	Rest of Installation Water Use	Biodefense Campus Water Use	Available Water Capacity	Capacity Utilization
Existing USAMRIID	470.4	43.4	216.2	70%
NIAID IRF	493.6	62.6	173.8	76%
NBACC Phase I	495.0	83.1	151.9	79%
NBACC Phase II	495.9	97.2	136.9	81%
Ultimate	502.4	192.0	35.6	95%

Rest of Installation Water Use increments include estimated increased consumption due to additional loading of incinerators and steam boilers.

Existing water use based on FY02 Installation Total, plus projected use by MCA, UEPH II, Animal Facility, Commissary, and PX.

All Biodefense Campus Water Use increments based on USAMRIID metric for water use FY00 through FY03.

NIAID IRF increment for Rest of Installation includes water consumption for RCI.

Units of water use or capacity: million gallons/year.

Table 4-6. Select Water Use Metrics for High Containment Facilities.

Water Use Metrics of Existing and Planned Facilities Incorporating
Biosafety Level-3 and Biosafety Level-4 Laboratories and Animal Facilities

FACILITY	FLOOR SPACE gross sq ft	METRIC million gallons/year per 100,000 sq ft	NOTES
NCI-Frederick	1,300,000	9.2	Includes administrative space
USAMRIID	339,000	12.8	Basis: four years average (FY 2000 – 2003)
NIH - Rocky Mountain Lab	325,000	8.2	Estimated from NIH Supplementary Draft EIS
The Salk Institute - GSD	210,000	29.9	Vaccine production facility (now defunct)
Battelle Memorial Institute	49,000	13.5	RDT&E facility

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Table 4-7. Water Use Scenario Analysis – Optimistic (Based on NIH Rocky Mountain Lab).

Biodefense Campus Increment	Rest of Installation Water Use	Biodefense Campus Water Use	Available Water Capacity	Capacity Utilization
Existing USAMRIID	470.4	43.4	216.2	70%
NIAID IRF	493.6	55.7	180.7	75%
NBACC Phase I	495.0	68.8	166.2	77%
NBACC Phase II	495.9	77.8	156.2	79%
Ultimate	502.4	123.0	104.6	86%

All Biodefense Campus Water Use increments based on “optimistic” metric. Ultimate increment includes replacement of all existing USAMRIID labs. Rest of Installation Water Use increments include estimated increased consumption due to additional loading of incinerators and steam boilers. Existing water use based on FY02 Installation Total, plus projected use by MCA, UEPH II, Animal Facility, Commissary, and PX. NIAID IRF increment for Rest of Installation includes water consumption for RCI. Units of water use or capacity: million gallons/year.

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5.0 FINDINGS AND CONCLUSIONS

An EBS was conducted to characterize the existing environmental conditions on and around the southern portion of the NIBC at Fort Detrick in Frederick County, Maryland. The NIBC will be comprised of laboratory facilities for biodefense research. The EBS subject site encompasses approximately 124.1 acres in the south-central portion of Area A of the Installation. The parcel is partially developed with administrative and laboratory facilities. The remaining undeveloped portions of the site are primarily grasslands.

Planning for the agencies which will occupy the NIBC is a dynamic process. At this time the precise locations of the various agencies within the NIBC are uncertain, however, the final locations of the facilities will be within the boundaries of the EBS subject site. It is unlikely that buildings currently on the site will be part of any real estate action associated with the NIBC.

Land constituting the EBS subject site was categorized into one of seven ECP classifications described in DA PAM 200-1 (*Environmental Protection and Enhancement*) dated 17 January 2002:

- “*Classification 1.* (white) Definition: Areas where no release or disposal of hazardous substances or petroleum products has occurred, including no migration of these substances from adjacent areas.
- *Classification 2.* (blue) Definition: Areas where only release or disposal of petroleum products has occurred.
- *Classification 3.* (light green) Definition: Areas where release, disposal, and/or migration of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.
- *Classification 4.* (dark green) Definition: Areas where release, disposal, and/or migration of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.
- *Classification 5.* (yellow) Definition: Areas where release, disposal, and/or migration of hazardous substances has occurred, and removal or remedial actions are under way, but all required remedial actions have not yet been taken.
- *Classification 6.* (red) Definition: Areas where release, disposal, and/or migration of hazardous substances has occurred, but required actions have not yet been implemented.
- *Classification 7.* (gray) Definition: Areas that are not evaluated or do not require additional evaluation.”

The most significant results of the EBS are summarized in Figure 5-1. Colors used on the figure correspond to the ECP classifications in DA PAM 200-1.

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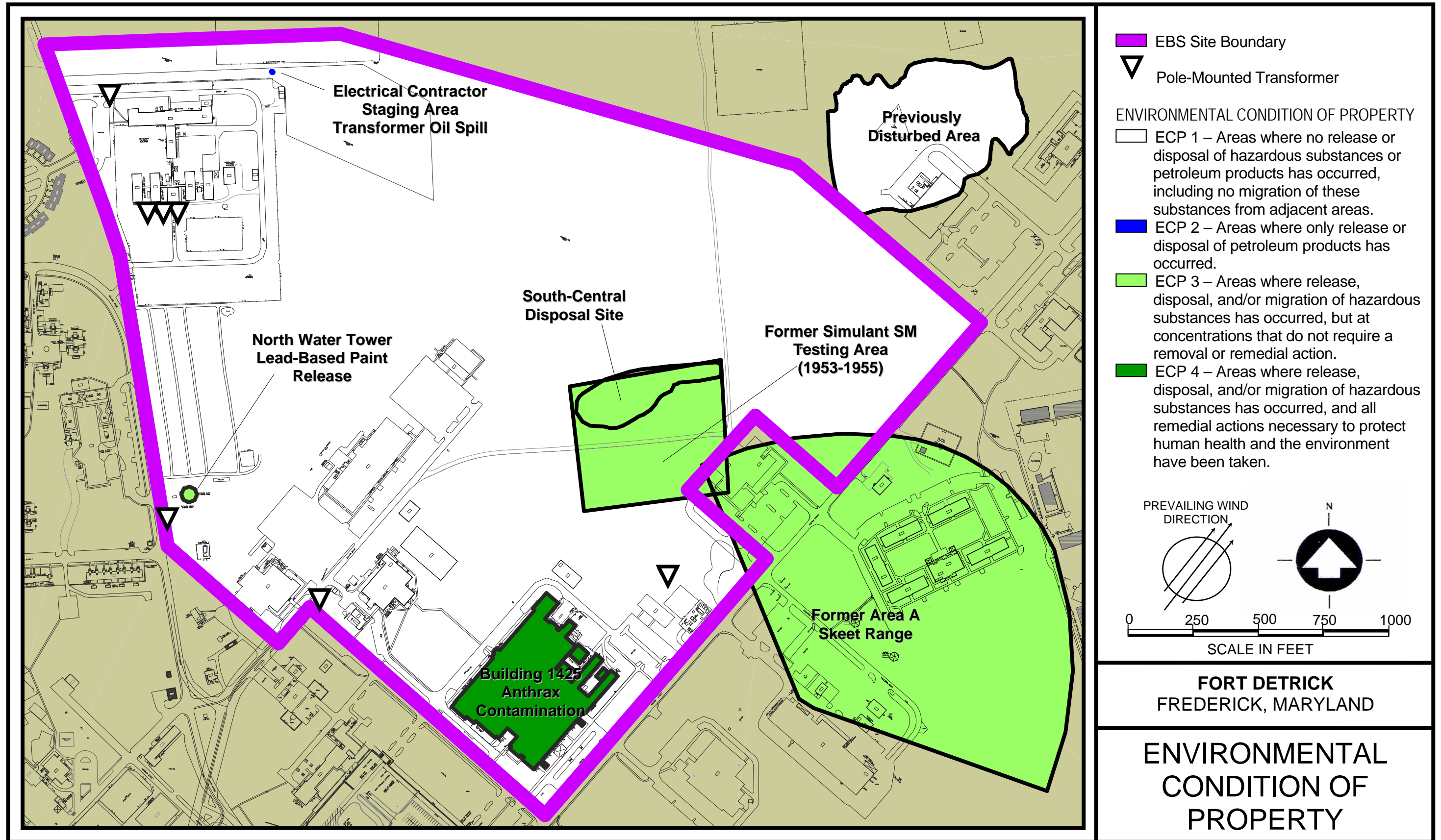


Figure 5-1. Environmental Condition of Property on the Southern Portion of the NIBC.

Details of the evaluations of the individual sites indicated on Figure 5-1 are discussed below.

- The site of a former recreational skeet range adjoins the NIBC on the southeast (a small portion of the campus near Building 1434 may have been affected). Residues of lead in the soil at this area were slightly elevated with respect to background levels but well below MDE risk-based concentration limits for residential or industrial land use, and remediation was not deemed necessary. This area is designated as ECP Classification 3 (areas where release, disposal, and/or migration of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action).
- The soil associated with the north water tower, located within the western portion of the EBS subject site, has lead concentrations above maximum background levels and USEPA residential and industrial screening levels based on a RI. The elevated level of lead was attributed to the weathering and sandblasting of lead-based paint covering the north water tower. A HHRA for the north water tower site concluded that non-residential use of the site will not pose an elevated risk of adverse effects on human health and recommended no further remedial action for this site. This area is designated as ECP Classification 3 (areas where release, disposal, and/or migration of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action).
- On 10 February 2004, USAG personnel observed a pole-mounted-type transformer lying on its side within the Electrical Contractor Staging Area for the Allegheny Power (Old Farm) electrical substation. The Electrical Contractor Staging Area is located north of Building 1301 on the EBS subject site. Visual observations determined that approximately five gallons of potentially PCB-contaminated oil had leaked in the immediate vicinity of the transformer. The transformer was placed in an overpack drum for off-site disposal by Allegheny Power. Initial field screening of the transformer oil indicated less than 50 ppm of PCBs. Follow-up laboratory analysis of the transformer oil verified PCB concentrations of less than 50 ppm. Approximately 30 gallons of soil in the immediate area of the spill was removed and placed in a 55-gallon drum and transported to the Fort Detrick HMMO for storage and future disposal. Upon receipt of laboratory analytical results indicating non-hazardous characteristics, the soil was transferred to the Fort Detrick incinerator for disposal. This area is designated as ECP Classification 2 (areas where only release or disposal of petroleum products has occurred).
- A release of anthrax bacteria occurred at a laboratory within Building 1425 (the main research facility of USAMRIID), located in the southern portion of the EBS subject site. Evaluation by USAMRIID concluded that the contamination was localized and due to a breach of lab procedures. Approximately 100 employees, who work in the vicinity of the affected area, were temporarily relocated and all potentially contaminated areas were disinfected with bleach. The facility was declared to be safe as of 22 April 2002. This area is designated as ECP Classification 4 (areas where release, disposal, and/or migration of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken).
- A previously disturbed area (apparently scraped or graded by heavy equipment), adjoining the northeast corner of the EBS subject site, was indicated from examination of aerial photographs from circa 1976. However, ground-proofing by personnel from BSA Environmental Services, Inc. and USAG in December 2003 found no evidence of

contamination. The area is currently grassland with a fenced-in antenna. This area is designated as ECP Classification 1 (areas where no release or disposal of hazardous substances or petroleum products has occurred, including no migration of these substances from adjacent areas).

- A previously unknown 2-acre disposal site, approximately 400 ft. northwest of Building 1434, was revealed by an airborne geophysical survey during 2001. The presence of buried materials was suspected, and subsequent investigations by visual reconnaissance, a ground-level electromagnetic sweep, and a trenching study indicated that the site had been used for the disposal of construction and/or demolition debris. Soil samples from the site had contaminant concentrations within background levels of the area. This area is designated as ECP Classification 1 (areas where no release or disposal of hazardous substances or petroleum products has occurred, including no migration of these substances from adjacent areas).
- An approximately 6-acre area including portions of the proposed sites for the NBACC and the NIAID was used for outdoor testing of a biological simulant during 1953-1955. The previously unknown 2-acre disposal site discussed above is contained within the former outdoor testing site. The simulant used was *Serratia marcescens*, a human pathogen responsible for a large percentage of nosocomial (hospital-related) infections. Human infections attributable to *S. marcescens* outside of hospital settings are uncommon. Although no testing has been performed to detect the presence of the bacterium, ample evidence from the literature indicates it is highly unlikely that populations of the organism would survive after 50 years. This area is designated as ECP Classification 3 (areas where release, disposal, and/or migration of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action).
- The possible presence of PCBs in the seven pole-mounted transformers observed on the southern portion of the NIBC is a potential concern. Though no evidence of a release of PCBs was noted during the site reconnaissance and there were no records of such a release occurring, there is potential that the pole-mounted transformers may leak in the future, releasing PCBs into the environment. No record was found indicating if these transformers contain PCBs. The locations of these transformers are designated as ECP Classification 1 (areas where no release or disposal of hazardous substances or petroleum products has occurred, including no migration of these substances from adjacent areas).

The relative percentage distribution of the ECP classifications based on surface area is provided in Table 5-1. Based on the ECP classification of the land within the EBS subject site discussed above, environmental conditions on the EBS subject site should not significantly impact real property actions.

Table 5-1. Summary of Environmental Condition of Property.

Parcel Name	ECP 1 (White)	ECP 2 (Blue)	ECP 3 (Light Green)	ECP 4 (Dark Green)
Existing Buildings/Structures	50.74%	-	0.74%	48.52%
Vacant Land	94.47%	0.00%	5.53%	-

6.0 ENVIRONMENTAL PLANNING CONSIDERATIONS

Although normally not part of an EBS, several potential environmental planning concerns were identified which may impact development of the NIBC.

The nature of the geology and soils within the southern portion of the NIBC may affect land use and development. Fracture traces and/or potential sinkholes are of concern as potential pathways for the migration of groundwater contamination.

- A photogeological analysis by the USACE revealed the presence of fracture traces and sinkholes throughout Area A. One sinkhole is located near the northwest corner of the EBS subject site, and three other sinkholes lie just outside (within approximately 300 ft.) of the campus' western and southern boundaries. One fracture trace lies entirely within the boundaries, and six additional fracture traces (along the northern and eastern boundaries) are partially within the campus.
- The regional geology underlying Area A is fractured limestone and dolomite of the Frederick Formation, which has been known to develop karst features such as sinkholes.
- The predominant soils at the NIBC are Duffield series (silt loams), which are characteristic of karst landscapes with a potential for sinkhole development.

Stormwater management issues will affect land use and development of the southern portion of the NIBC. The majority of the site slopes from northwest to southeast.

- The area within that part of the campus covered by impervious surfaces is estimated to increase from the present 15.4 acres to 40.3 acres upon completion of the build-out.
- The volume of stormwater runoff, particularly from the eastern side of the campus where most of the new building is planned, will increase. A stormwater management study is underway.

Forestation and reforestation will be required as a result of the proposed activities on the NIBC.

- Planned construction will encroach upon Forest Block 1. Ultimately, about 1.8 acres of currently forested land will be disturbed, which will require reforestation of approximately 3.6 acres.
- A portion of the forested land that may be encroached upon was in the past monitored by the USDA for a growth regulator project.
- In addition, approximately 48.7 acres of grassland will be disturbed, which will require afforestation of 7.3 acres.

On-site utility capacity will be adequate for NBACC, but water supply could limit the ultimate development of the southern portion of the NIBC.

- Additional demand for electricity, water, and steam by NBACC and the additional quantities of wastewater, municipal solid waste, and medical waste generated will be small increments relative to the respective existing capacities.
- Current water use at Fort Detrick combined with the estimated additional water demand for projects currently under construction (UEPH II, Animal Facility, Commissary, and PX) will consume approximately 70% of the 730 million gallon per year capacity of the Fort Detrick WTP. This capacity is dictated by MDE water withdrawal permit limits. The additional water requirements for projects currently in design (RCI, NIAID, and NBACC) and later additions to the NIBC will likely increase consumption to approximately 95% of capacity. Even under the

most optimistic water use scenario, the capacity utilization on an annual average basis would be approximately 86%, assuming other sources of water are not available.

- Additional demand for other utilities, additional utilization of the Fort Detrick WWTP, and additional operation of the incinerators will all be well within the respective existing capacities.

Potential release of biological agents from the LSS would be of concern, although there is no evidence that such a release has occurred.

- Construction or demolition activities affecting the LSS are not anticipated in the near future. The system serves only Buildings 1412 and 1425 (USAMRIID), and it remains in operation pending funding for it to be decommissioned.
- The area potentially affected by such a release is at the south end of the NIBC (Buildings 1412 and 1425) and further to the southwest, away from the area of new construction.

Air permitting issues also are likely to affect development of the southern portion of the NIBC since the Frederick area is in nonattainment for ozone.

- Criteria pollutant emissions (nitrogen oxides and sulfur dioxide) will be increased as a result of additional steam boiler and incinerator operation.
- NSR/PSD may be required under Title V of the CAA.

Potential environmental impacts could result from increased traffic/parking burdens in the southern portion of the NIBC.

- Environmental impacts include increased amounts of air pollution and traffic.
- Because traffic conditions in the area adjacent to the Installation are anticipated to deteriorate by 2007, detailed traffic studies may be needed to mitigate the impacts of NIBC traffic congestion and emissions on the surrounding community.

The concentrations of EMFs on the NIBC will be elevated in localized areas from the Old Farm Substation, the existing AP transmission lines, and the substation north of Porter Street which is also slated for expansion.

- An authoritative report issued in 1999 under the auspices of the NIEHS noted that evidence from epidemiological studies suggests “small increased risk with increasing exposure” associated with two forms of cancer, childhood leukemia and chronic lymphocytic leukemia in occupationally exposed adults. However, the NIEHS report indicated that results of laboratory (animal and human) toxicology and mechanistic studies fail to indicate a cause-and-effect relationship between exposure to EMF at environmental levels and disease.
- Various electronic equipment as well as magnetic data carriers may be affected by magnetic fields including cathode ray devices, electronic implants such as cardiac pacemakers, computers, magnetic storage media, credit cards, and analog watches may be affected. USDA reports that some laboratory equipment apparently has been affected since the AP substation became operational.

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9.0 ACRONYMS AND ABBREVIATIONS

ACM	Asbestos-Containing Material
AEDB-R	Army Environmental Database Restoration
AFMESA	Air Force Medical Evaluation Support Activity
AFMLO	Air Force Medical Logistics Office
AP	Allegheny Power
AR	Army Regulation
ARMA	Air and Radiation Management Administration
AST	Aboveground Storage Tank
ASTM	American Society for Testing and Materials
BMPs	Best Management Practices
BW	biological warfare
CAA	Clean Air Act
CAP	Corrective Action Plan
ccf	hundreds of cubic feet
CERCLIS	Comprehensive Environmental Response, Compensation and Liability Information System
CFR	Code of Federal Regulations
cfs	cubic foot per second
CID	Center for Infectious Disease
CO	Carbon Monoxide
COMAR	Code of Maryland Regulations
CORRACTS	Corrective Action Activity Database
DA	Department of the Army
DHS	Department of Homeland Security
DIS	Directorate of Installation Services
DOIM	Directorate of Information Management
DSERTS	Defense Site Environmental Restoration Tracking System
EA	Environmental Assessment
EBS	Environmental Baseline Survey
ECP	Environmental Condition of Property
FINDS	Facility Index System Database
ft.	feet
ft. ²	square feet
gpm	gallons per minute
gsf	gross square feet
HAP	Hazardous Air Pollutant
HCC	Hotel and Conference Center
HHRA	Human Health Risk Assessment
HMMO	Hazardous Material Management Office
hp	Horsepower
IRF	Integrated Research Facility
JRCAB	Joint Readiness Clinical Advisory Board
kV	kilovolt
kW	kilowatt
kWh	kilowatt hour
LBP	Lead-Based Paint
lbs	pounds
LSS	Laboratory Sewer System

LUST	Leaking Underground Storage Tank
MCA	Military Construction Army
MDE	Maryland Department of the Environment
MEDDAC	U.S. Army Medical Department Activity
mG	milliGauss
mgd	million gallons per day
MGS	Maryland Geological Survey
NAAQS	National Ambient Air Quality Standards
NBACC	National Biodefense Analysis and Countermeasures Center
NCI	National Cancer Institute
NIAID	National Institute of Allergy and Infectious Diseases
NIBC	National Interagency Biodefense Campus
NIEHS	National Institute of Environmental Health Sciences
NIH	National Institutes of Health
NO _x	Nitrogen Oxides
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRC	National Response Center
NRHP	National Register of Historic Places
NSR	New Source Review
O ₃	Ozone
Pb	Lead
PCBs	Polychlorinated biphenyls
pCi/L	picoCuries per liter
PM	Particulate Matter
ppb	parts per billion
PPE	personal protective equipment
ppm	parts per million
PSD	Prevention of Significant Deterioration
PTO	Permit to Operate
PX	Post Exchange
RCI	Residential Community Initiative
RCRA	Resource Conservation and Recovery Act
RCRIS	Resource Conservation and Recovery Information System
RI	Remedial Investigation
SAP	Satellite Accumulation Points
SARA	Superfund Amendments and Reauthorization Act
SHMs	spent hazardous materials
SO ₂	Sulfur Dioxide
SSP	steam sterilization plant
TAP	Toxic Air Pollutant
TCE	Trichloroethylene
TPQ	Threshold Planning Quantity
TSCA	Toxic Substances Control Act
UEPH	Unaccompanied Enlisted Personnel Housing
USACE	U.S. Army Corps of Engineers
USAEC	U.S. Army Environmental Center
USAEHA	U.S. Army Environmental Hygiene Agency
USAG	U.S. Army Garrison
USAMISSA	U.S. Army Medical Information Systems and Services Agency
USAMMA	U.S. Army Medical Materiel Agency

USAMRIID	U.S. Army Medical Research Institute of Infectious Diseases
USAMRMC	U.S. Army Medical Research and Materiel Command
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	Underground Storage Tank
VOCs	Volatile Organic Compounds
WTP	Water Treatment Plant
WWTP	Waste Water Treatment Plant

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